

Sidewalk Details

A Guide for Washington
Local Agencies, Tribes
and Nations



**Washington State
Department of Transportation**
Highways & Local Programs Service Center

Sidewalk Details

A Guide for Washington Local Agencies and Tribes

Written by:
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Contents

	Page
Foreword	i
Acknowledgements	i
Introduction	ii
Section I: Sidewalk Curb Ramps at Marked Crossings	
Design Considerations	
Turning Radius	
Crosswalk Location	
Line-of-Sight	
Traffic Lane Conflict	
Ramp Side Slopes	
Landings and By-Passes	
Section 2 Sidewalk Ramp Details	
Sidewalk Ramp Detail A — Two Sidewalk Ramps	
Sidewalk Ramp Detail B — Planting Strips and Sidewalk Ramps	
Sidewalk Ramp Detail C — Ramps Within the Curve Radius	
Sidewalk Ramp Detail D — Ramping the Entire Sidewalk	
Sidewalk Ramp Detail E — Dual Ramp With By-Passes	
Sidewalk Ramp Detail F — Parallel Ramps	
Section 3 Driveway Approach Details	
Driveway Approach Detail A — Parallel Sidewalk	
Driveway Approach Detail B — Routed Sidewalk	
Driveway Approach Detail C — Routed Sidewalk, Planting Strip Present	

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Foreword

The purpose of this document is to provide Washington's local agencies with a resource for developing pedestrian facilities at intersections. These details have been developed from designs currently being used throughout the state by WSDOT and local agencies.

This document is a guide only. It does not constitute a legal mandate nor does it represent authority, delegated responsibility, nor establish standards for good practice for roadway engineering, maintenance, or management. It is a compilation of existing details currently used around the state of Washington. It is intended to provide guidance to local agencies and tribes for incorporating sidewalk intersection details into their designs.

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Introduction

To encourage multimodal transportation, “liveable communities,” and pedestrian safety, the current trend is to provide more “pedestrian friendly” design features along our streets, roads, and highways. The phrase “pedestrian friendly” means providing sidewalks, ADA accessible routes, landscaping, and a number of other amenities to encourage pedestrian traffic, promote safety, and lessen the stark impact of strictly utilitarian roadways. The purpose of this document is to provide the reader with curb ramp details that can be incorporated into highway and street designs to assist in these efforts.

A major consideration in the design and construction of sidewalks and other pedestrian facilities is accommodating all people in a manner that will not discriminate against those with physical disabilities or limitations. The Americans with Disabilities Act (ADA) accessibility guidelines is the primary source of information for this consideration. At present these guidelines are being reassessed. New guidelines have been proposed, but have not been finalized. Until final guidelines are approved, the Federal Register Part II interim Final Rule dated June 20, 1994, adopted by the Federal Highway Administration, is the current standard for federally funded highway and street construction projects.

Section 1 Sidewalk Curb Ramps at Marked Crossings

Design Considerations

Sidewalk ramps provide a barrier-free route from an elevated (six-inch high) sidewalk down to the roadway surface for people in wheelchairs. They are a key element in sidewalk design.

Design of these ramps has undergone many variations in the past two decades. The diagonal ramp in particular, has been a major concern. A diagonal ramp in this context is a single ramp located at about the midpoint of the right turn curb curve. These types of ramps are a relatively simple and inexpensive “fix” to provide accessibility at intersections. When positioned poorly, however, they can be both inconvenient and hazardous for people in wheelchairs.

New guidelines now expressly prohibit diagonal ramps in new construction and require two ramps, one for each pedestrian crossing. Figure 60 in the Appendix of the Federal Register illustrates this arrangement and is reproduced in Figure 1-1.

The figure, however, seems to represent intersections where the curb radii are in the range of five to ten feet.

Turning Radius

Small right-turn radii are usually a common condition within the central business district of a city where the constraints of limited right of way and adjacent buildings have not allowed reconstruction of the street system.

Modern roadway and intersection design must accommodate a wide range of different vehicles. Trucks and buses require a much larger turning radius to execute a right-turn than a passenger vehicle.

This condition is depicted in the two drawings shown in Figures 1-2A and 1-2B. These drawings have been drawn to scale and are a more accurate portrayal of the problems that occur at these intersections.

Figure 1-2A shows a large truck’s turning path from a side street onto a multi-lane roadway. The right-turn curb radius is only 25 feet in this example. To turn right, the tractor swings wide taking both through lanes on the cross street while the trailer tracks along a different, shorter path. This condition is commonly called “off-tracking.” Note that the trailer climbs the curb and travels across the sidewalk. Figure 1-2B shows the same truck performing the maneuver around a larger, 45-foot radius right-turn curb. The larger radius does not interfere with the truck’s turn and the trailer tracks on the roadway.

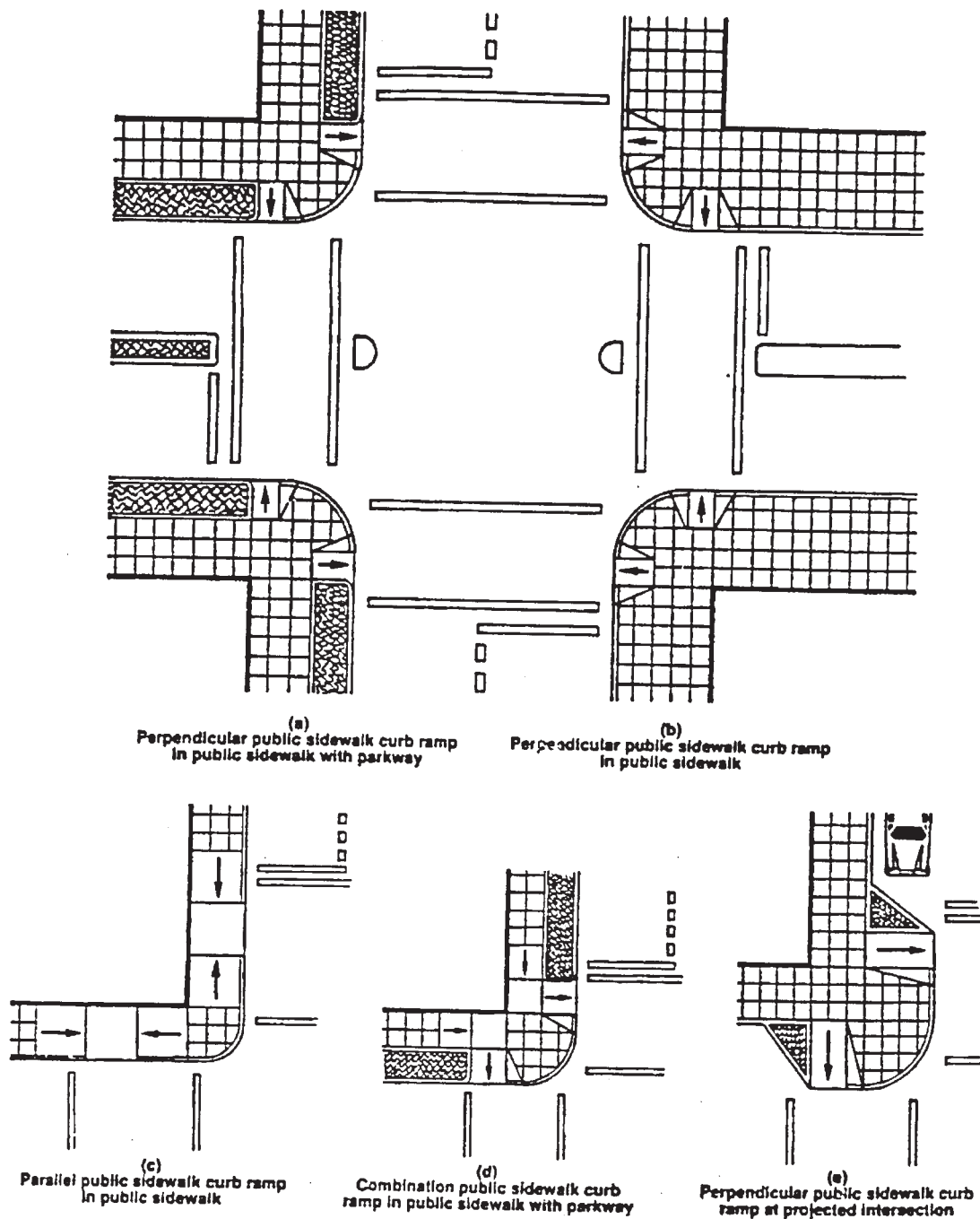


Fig. 60
Public Sidewalk Curb Ramps at Marked Crossings

Figure 1-1

Figure 60 Federal Register/ Vol. 59, No. 117/
Monday, June 20, 1994/Rules and Regulations

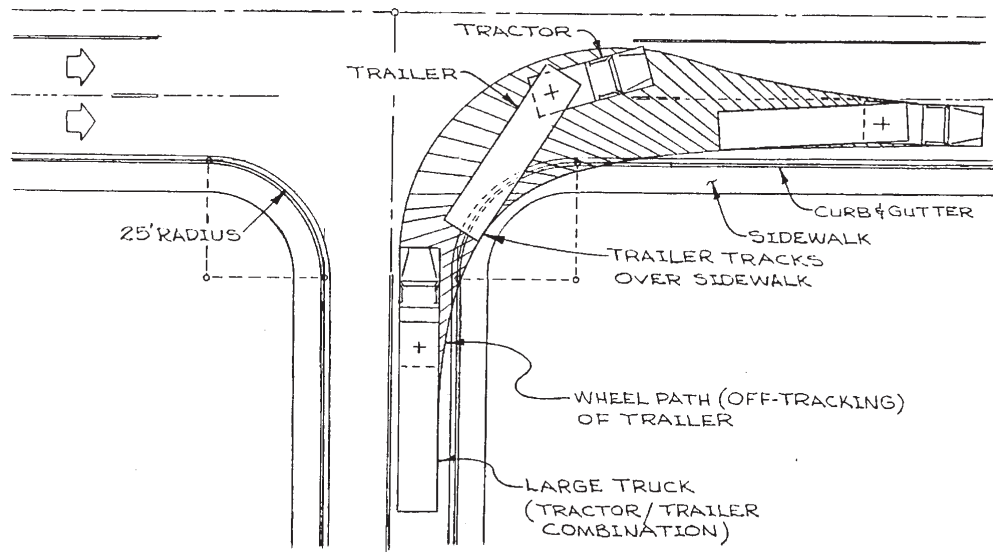


Figure 1-2A
Plan — Example of Truck Turning Paths with
Small Right-Turn Radius

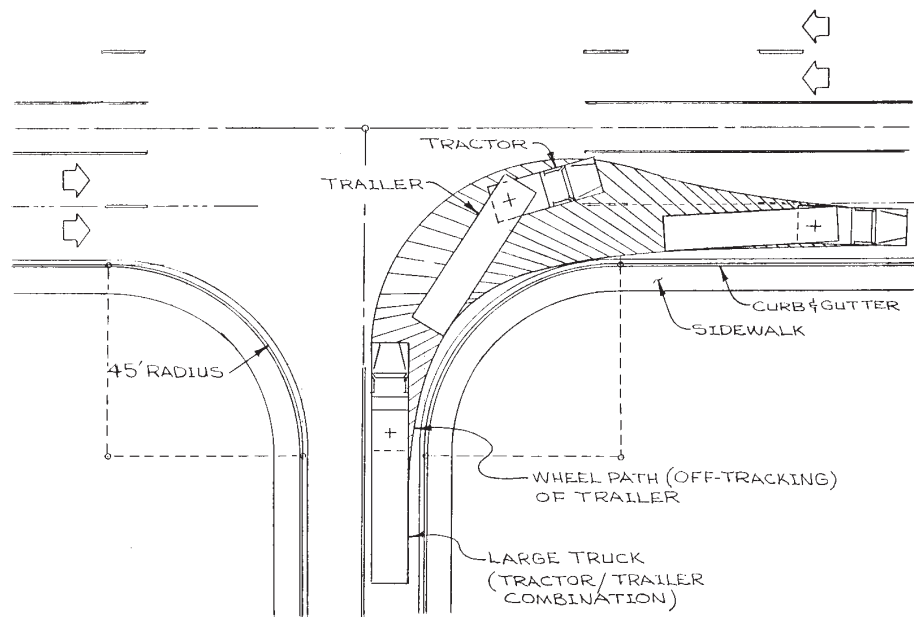


Figure 1-2B
Plan — Example of Truck Turning Paths with Large Right-Turn Radius

A strict interpretation of the requirement of placing two ramps beyond the right-turn radius may not be practical. Although it provides a large curb radius for trucks and busses, it places the sidewalk ramp, pedestrian crossing, and stopped vehicle too far from the intersection. This condition is shown in the intersection example shown in Figure 1-3. The radii used at this intersection are 55 feet with 50-foot tapers for trailer “off-tracking.”

Crosswalk Location

The location of the crosswalks dictates the stopping point for vehicular traffic and, in this example, are 75 and 85 feet from the intersecting roadway. At these locations, the motorists do not have a clear view of the other approaches to the intersection. It would be necessary for the motorist to move forward well beyond the crosswalks to determine if there are other vehicles approaching from the cross road. This is an undesirable condition and will result in conflicts with the pedestrians in the crosswalks.

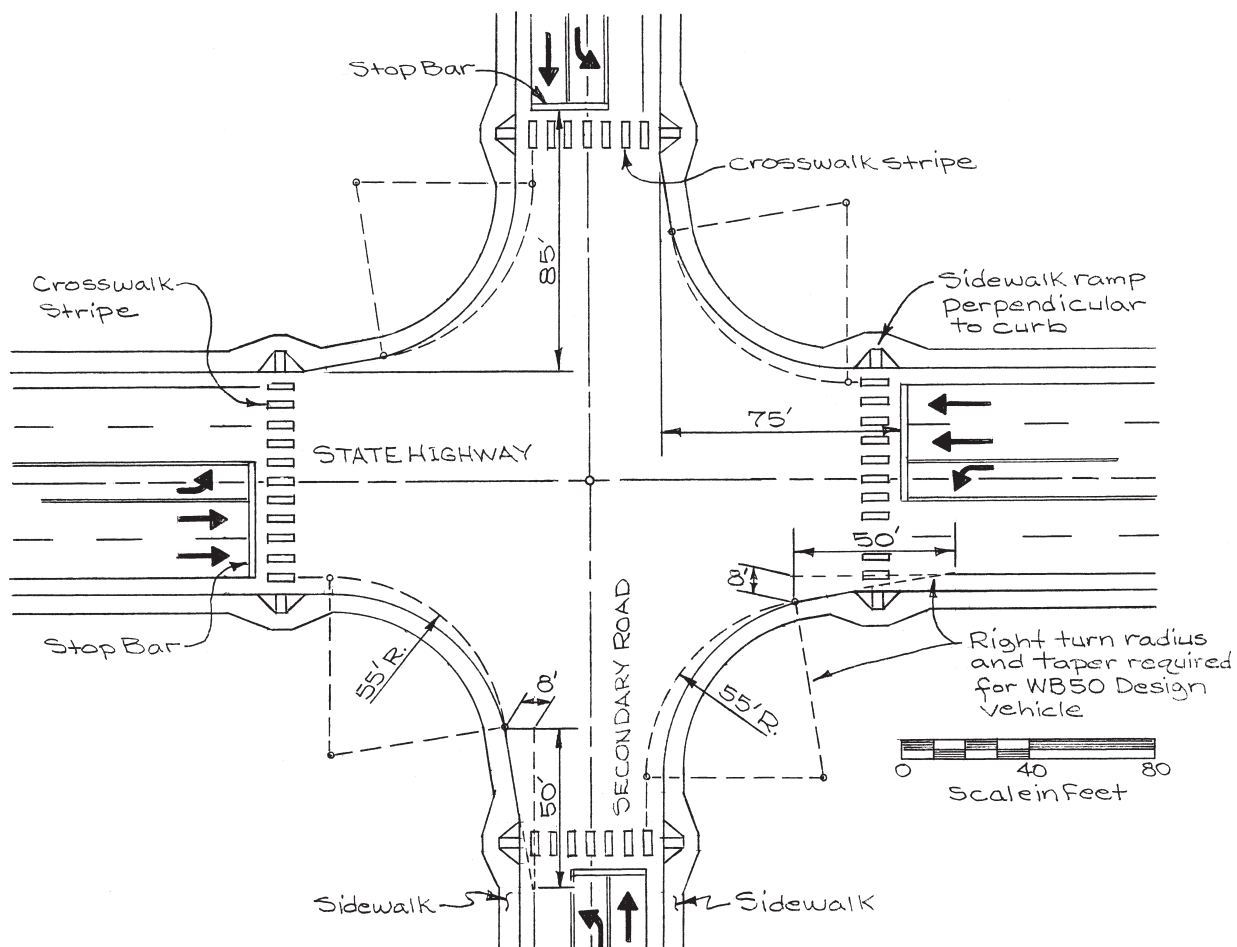


Figure 1-3
Example of ADA Sidewalk Ramp Placement

Line of Sight

Also, placing the sidewalk ramp beyond the curb curve of even a moderately large radius places the pedestrians at a location where they will not be readily seen by right-turning motorists. This condition is illustrated in Figure 1-4. The line of sight between the motorist and the pedestrian is across an area behind the sidewalk. These areas will often have signs, utility poles and shrubbery that can obscure the line of sight. This area can also be outside the right of way and beyond the control of highway agency.

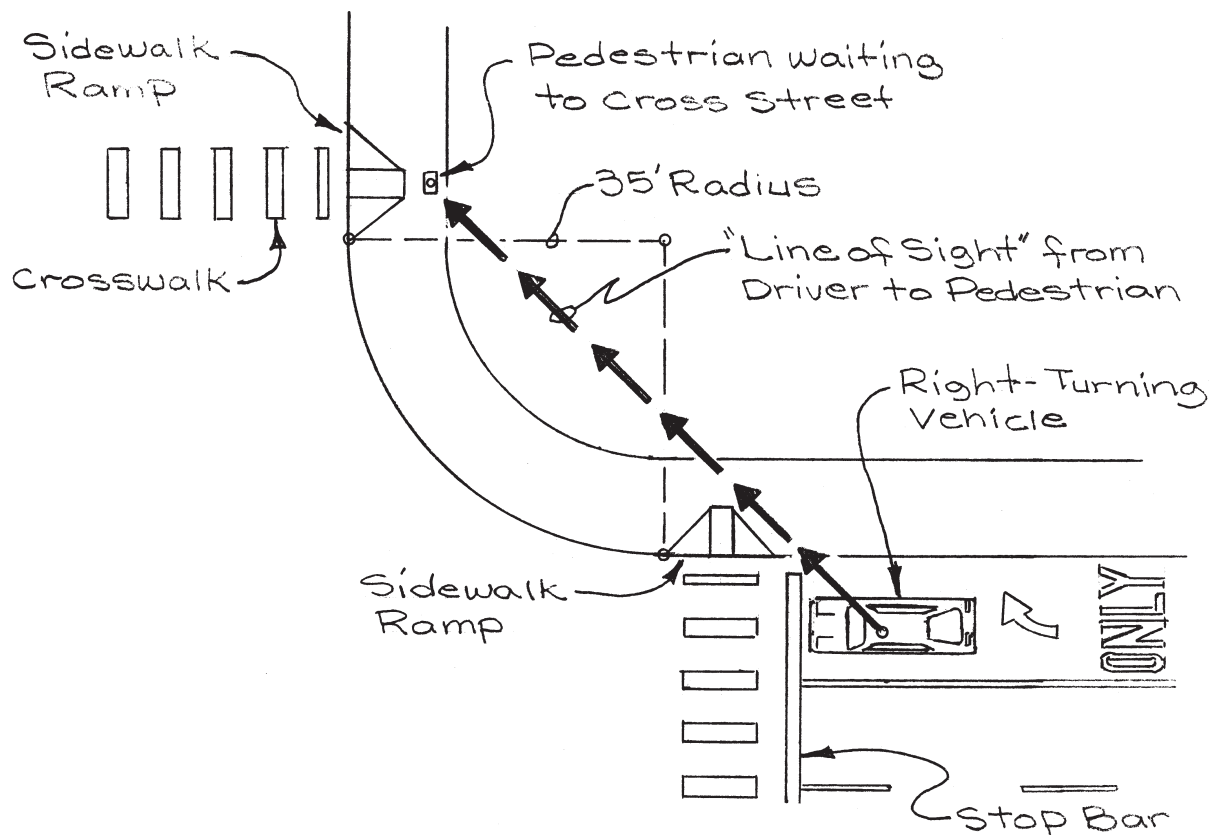


Figure 1-4
Illustration of Sight Distance

Traffic Lane Conflict

The reasons cited in the Federal Register for prohibiting the single diagonal ramp mainly deal with poorly placed ramps which directed the wheelchair into a through traffic lane (see Figure 1-5A) or required unnecessary travel from the ramp to the crosswalk (Figure 1-5B).

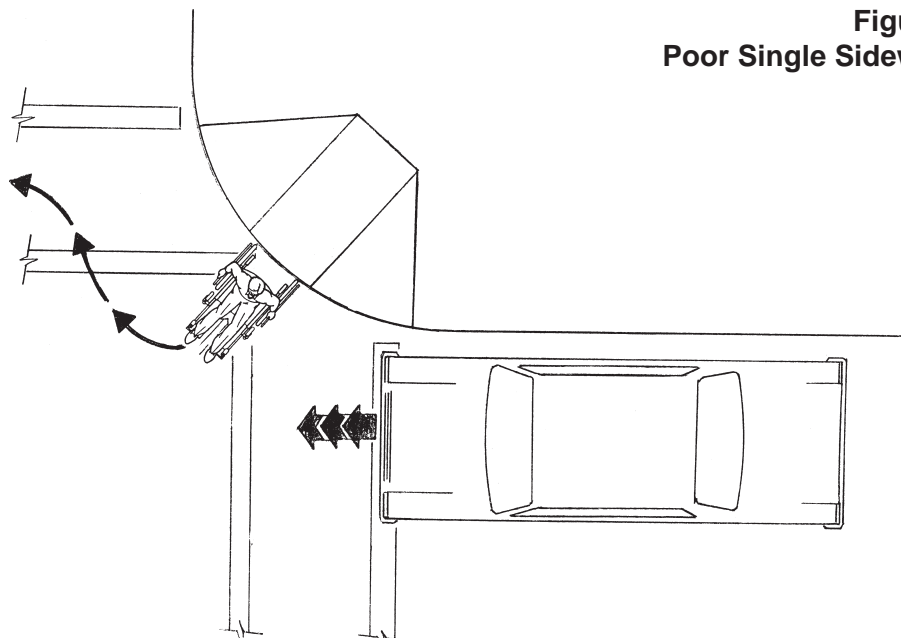


Figure 1-5A
Poor Single Sidewalk Ramp Placement

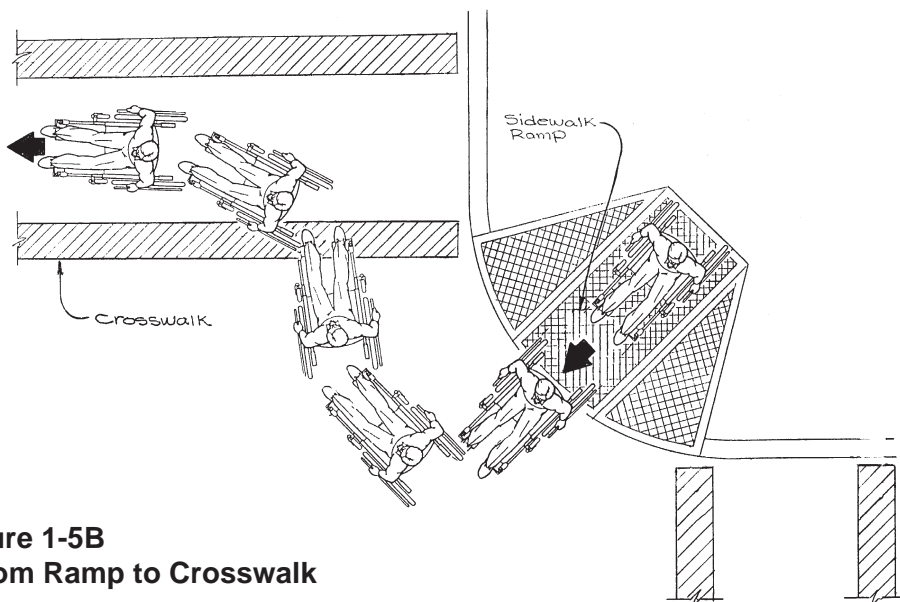


Figure 1-5B
Wheelchair Path from Ramp to Crosswalk

Ramp Side Slopes

The diagonal ramp, while not the preferred installation, may be the only acceptable solution when reconstructing (altering) an existing intersection.

The primary problem with sidewalk ramps are the triangular shaped side slopes leading down to the ramp. These surfaces are fairly steep and cannot be negotiated safely by a person in a wheelchair. As the wheelchair approaches the sloped side, the outside wheel rolls down the face while the inner wheel remains stationary. This causes the wheelchair to rotate inward and can tip the occupant outward into the roadway. Therefore, all new sidewalk ramps should be designed to allow a head-on approach.

Landings

This is accomplished by providing a 4-foot wide, level landing at the back of the ramp. A narrower, 3-foot landing can be used where the wider landing cannot be installed because of right of way constraints. See Figure 1-6A. This landing also allows a bypass route for people not wishing to use the ramp to cross the street. See Figure 1-6B.

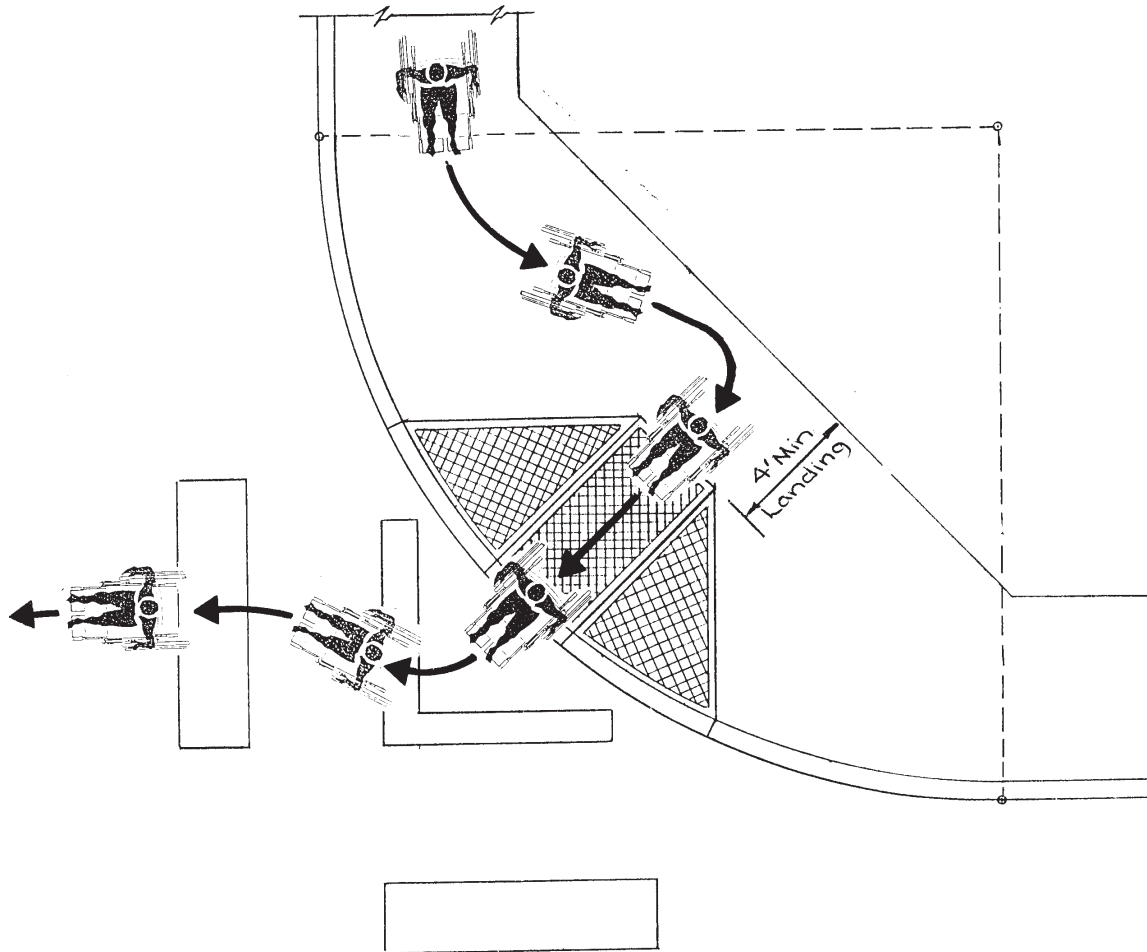


Figure 1-6A
Examples of Desirable Sidewalk and Ramp Layout

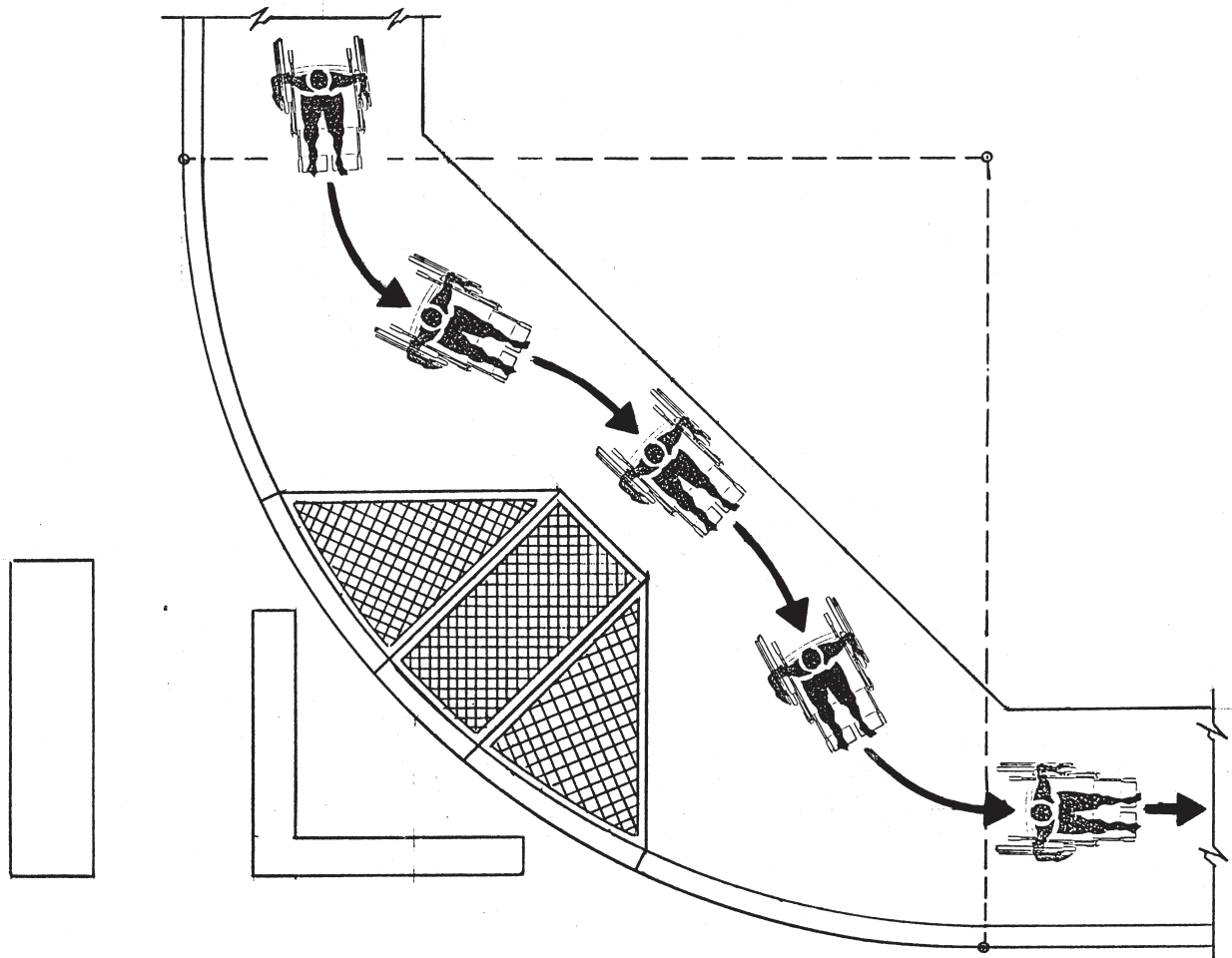


Figure 1-6B
Wheelchair Bypass Behind Sidewalk Ramp

1:P:DP/H&LP

Sidewalk Ramp Detail A — Two Sidewalk Ramps

This detail uses two sidewalk ramps, one at each end of the curb radius. The combined width of the top of curb (6 inch), wheelchair landing (4 foot desirable, 3 foot min.), and wheelchair ramp (6 feet) yields a minimum 10 feet – 6 inch slab width. The back edges of the two sidewalks intersect at the radius point of the curb radius resulting in a curb radius of 10 feet – 6 inches.

This detail would seem most appropriate in the central business district of a city where tight curb radii are necessary to have the least impact on adjacent property owners.

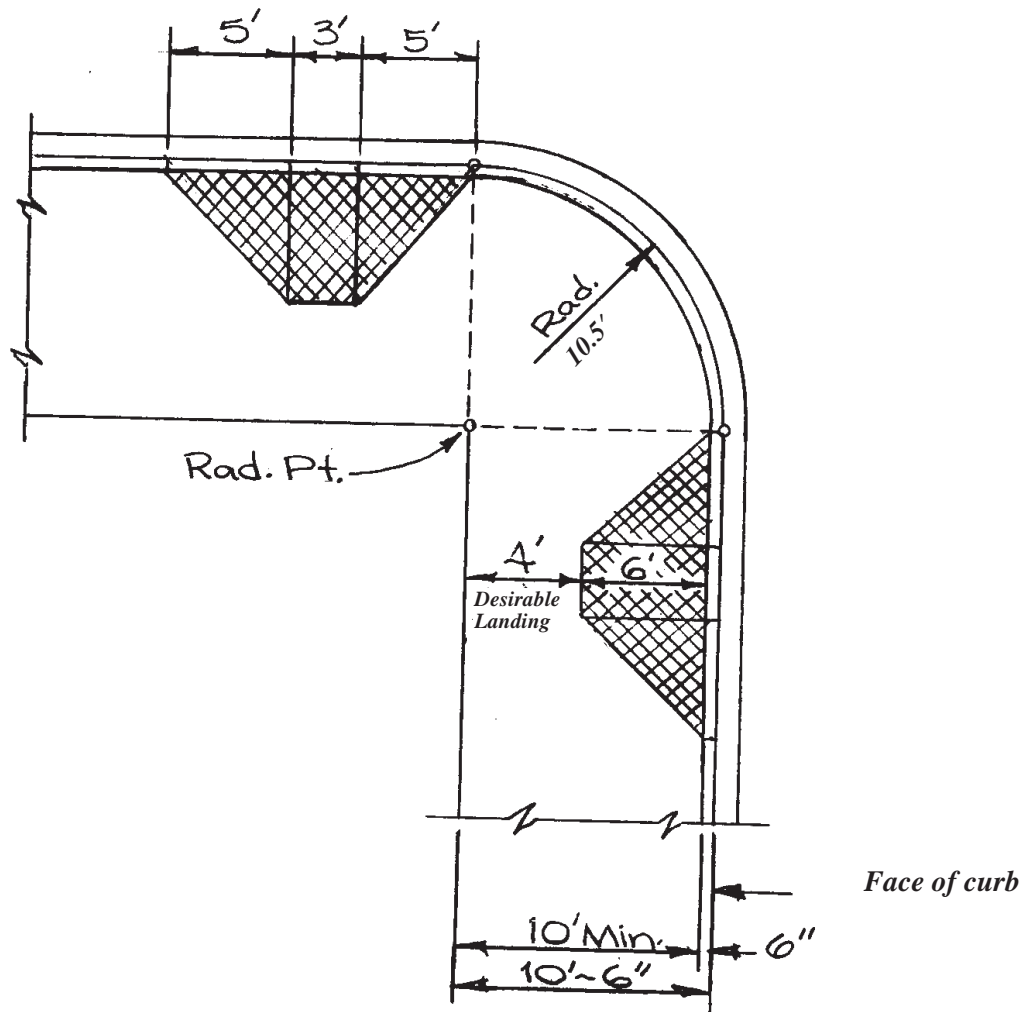


Figure 2-1
Plan — Sidewalk Ramp Detail A

As noted previously, small radius curb curves are not used when vehicles larger than a passenger car are expected to use the intersection. The larger turning paths of trucks and buses require the curb to be set back farther to allow for the right turn maneuver.

At these larger radii, other elements come in to play which are not apparent in this type of detail. Figures 2-1A, B, and C illustrate three possible options for Sidewalk Ramp Detail A when a larger radius curb curve is used.

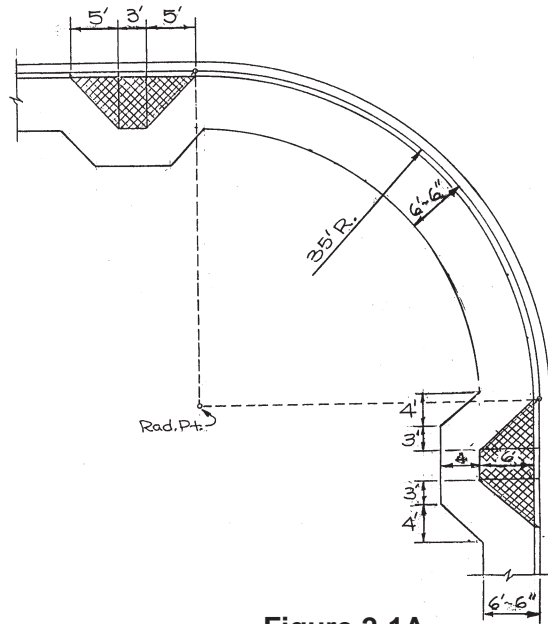


Figure 2-1A

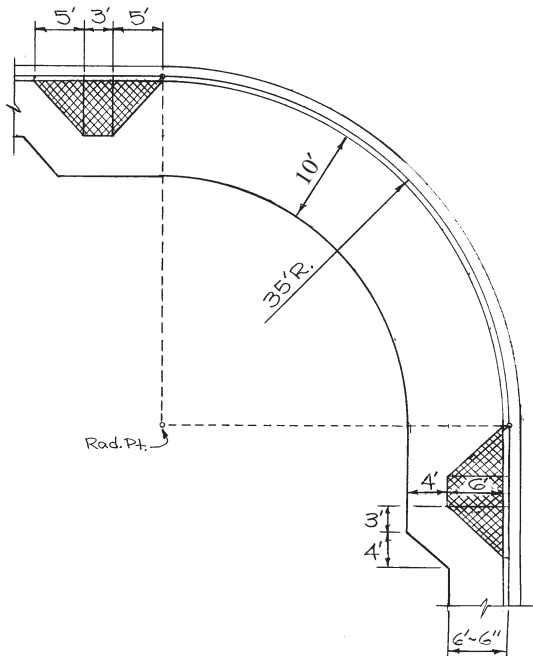


Figure 2-1B

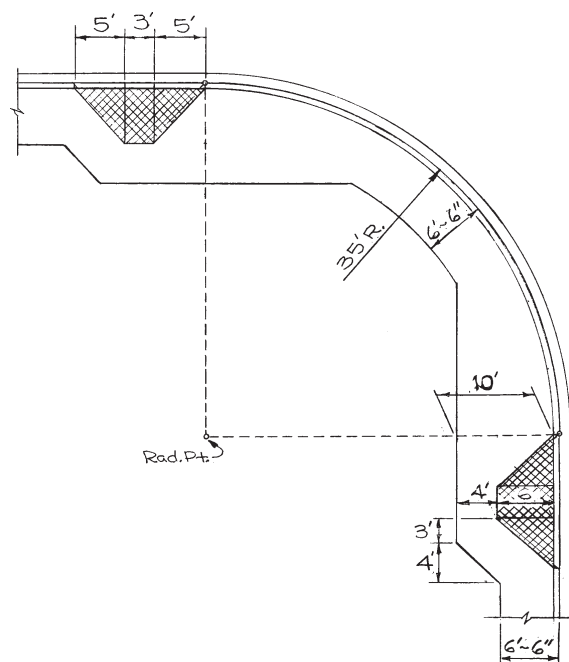


Figure 2-1C

Sidewalk Ramp Detail B — Planting Strip

This detail is intended for locations where there is a planting strip between the roadway curb and the sidewalk. It is similar to Detail A in that the sidewalk ramps are located beyond the curb radii. ADA requires a one in 12 maximum slope for sidewalk ramps. To accommodate a 6-inch rise for the curb height, the ramp must be at least 6 feet long. Because of the wraparound curb, the planting strip must match the length of the ramp, resulting in the planting strip also being 6 feet in width. The sidewalk, in this example, is shown as being a minimum width of five feet. As in the case of the Sidewalk Ramp Detail A, the combined distances of the ramp length/planting strip width, the sidewalk width, and the top of the curb, results in a minimum curb radius of 11 feet – 6 inches.

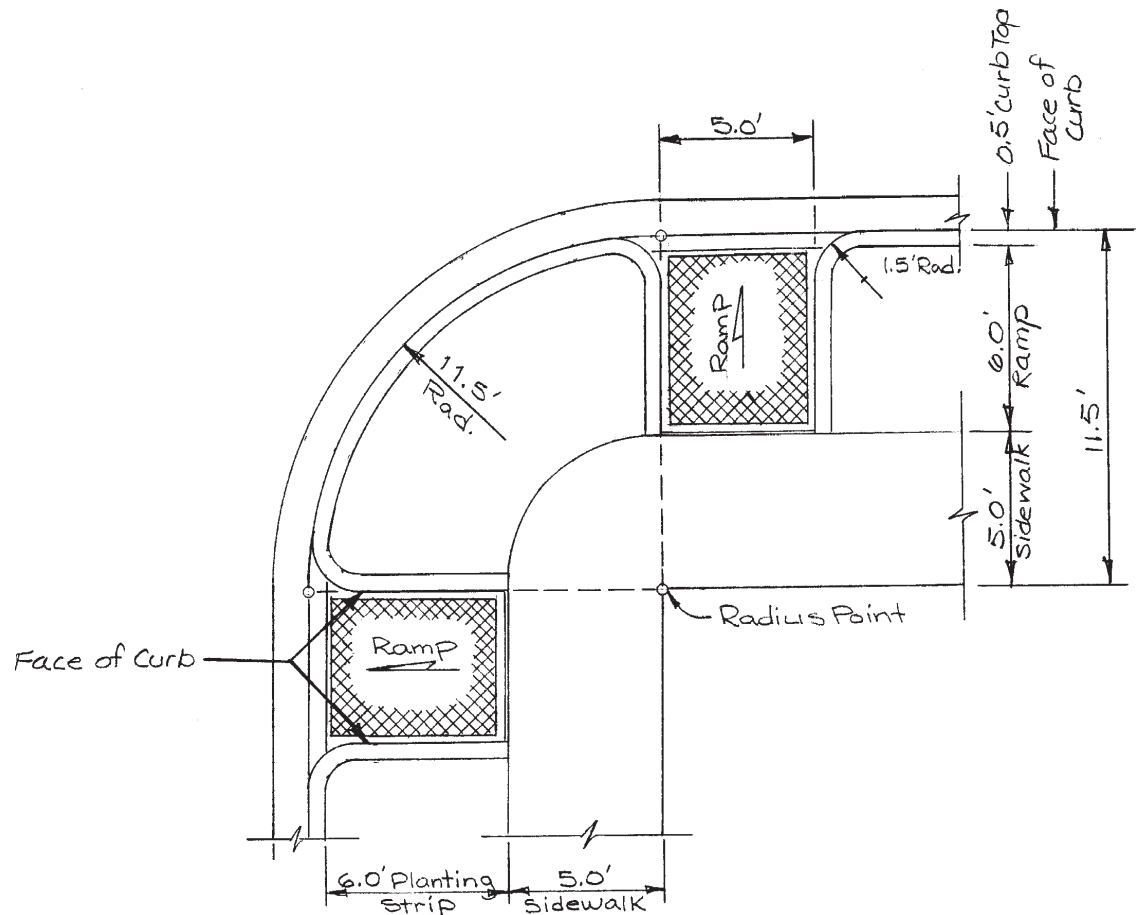


Figure 2-2
Plan — Sidewalk Ramp Detail B

As stated previously, in the discussion on the Sidewalk Ramp Detail A, this is not a commonly used radius. When larger radii are used, certain detail considerations come into play. The location of the ramps at the beginning of the curb curves dictates that the crosswalks must also be at this location. Since the stop bars must be located behind the crosswalks, this creates a somewhat difficult condition for the motorist. At this location the driver's view of the intersection is restricted and the time required for the vehicle to cross the opposing traffic lanes is greatly increased. The intersection plan shown in Figure 2-3 depicts this condition.

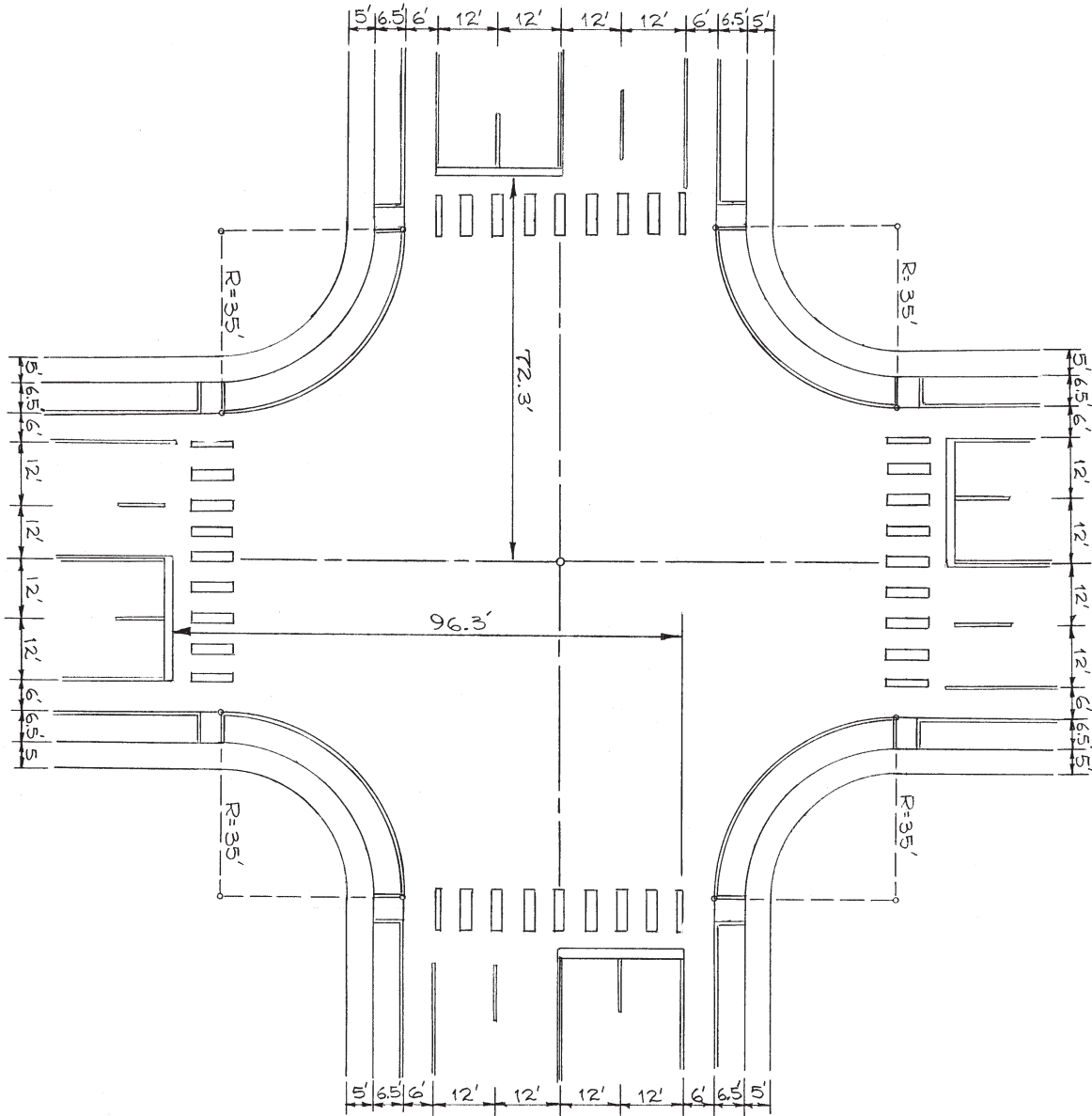


Figure 2-3
Typical Intersection Plan with Large Curb Radii

Sidewalk Bulbs

Locating the sidewalk ramps beyond the curb radius tends to position the pedestrian beyond the right turning driver's normal line of vision. A more desirable design would include the use of the sidewalk bulb where on-street parking is permitted and a planting strip separates the roadway from a sidewalk. This detail, as shown in Figure 2-4, allows the ramps to become extensions of the sidewalks. Pedestrians waiting to cross the street will be more visible to motorists and the length of the crosswalk will be significantly shorter.

The sidewalk bulb detail has a somewhat limited application and would certainly not be appropriate for intersections along high speed, high volume roadways.

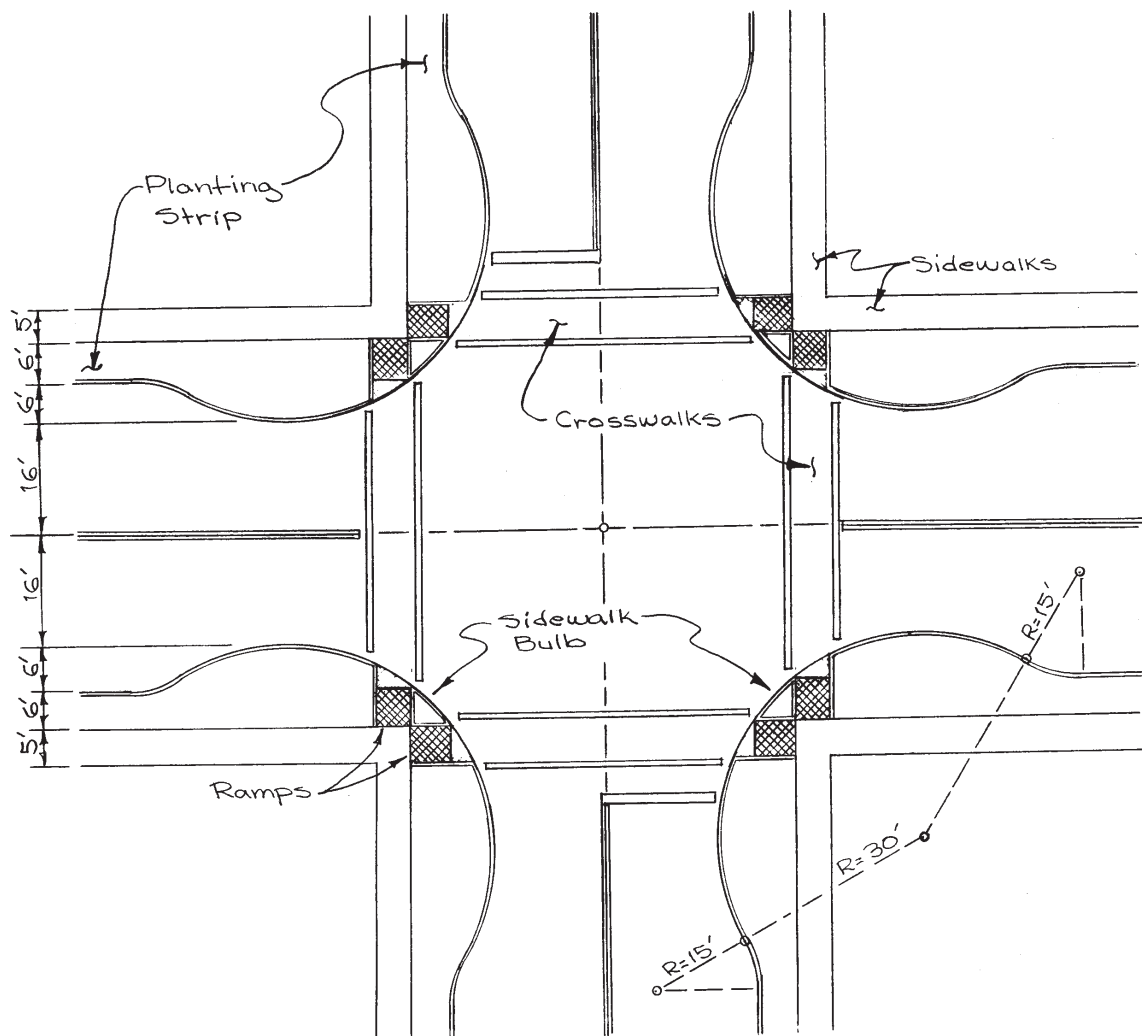


Figure 2-4
Typical Intersection Plan with Sidewalk Bulbs

This detail has had some success as a “Traffic Calming” strategy in residential and central business district settings.

The design of an intersection with sidewalk bulbs must have curb radii which will accommodate the “Design Vehicle” or the largest vehicle which will use this intersection. Both the WSDOT *Design Manual* and the AASHTO *A Policy on Geometric Design of Highways and Streets* have turning templates which show the wheel path for various vehicles.

In the example shown in Figure 2-5, the design vehicle is a SU (single unit) Vehicle. The turning path for a right turning SU Vehicle was superimposed on the intersection and the curb radius has been adjusted to clear the path of the right rear wheel of the truck.

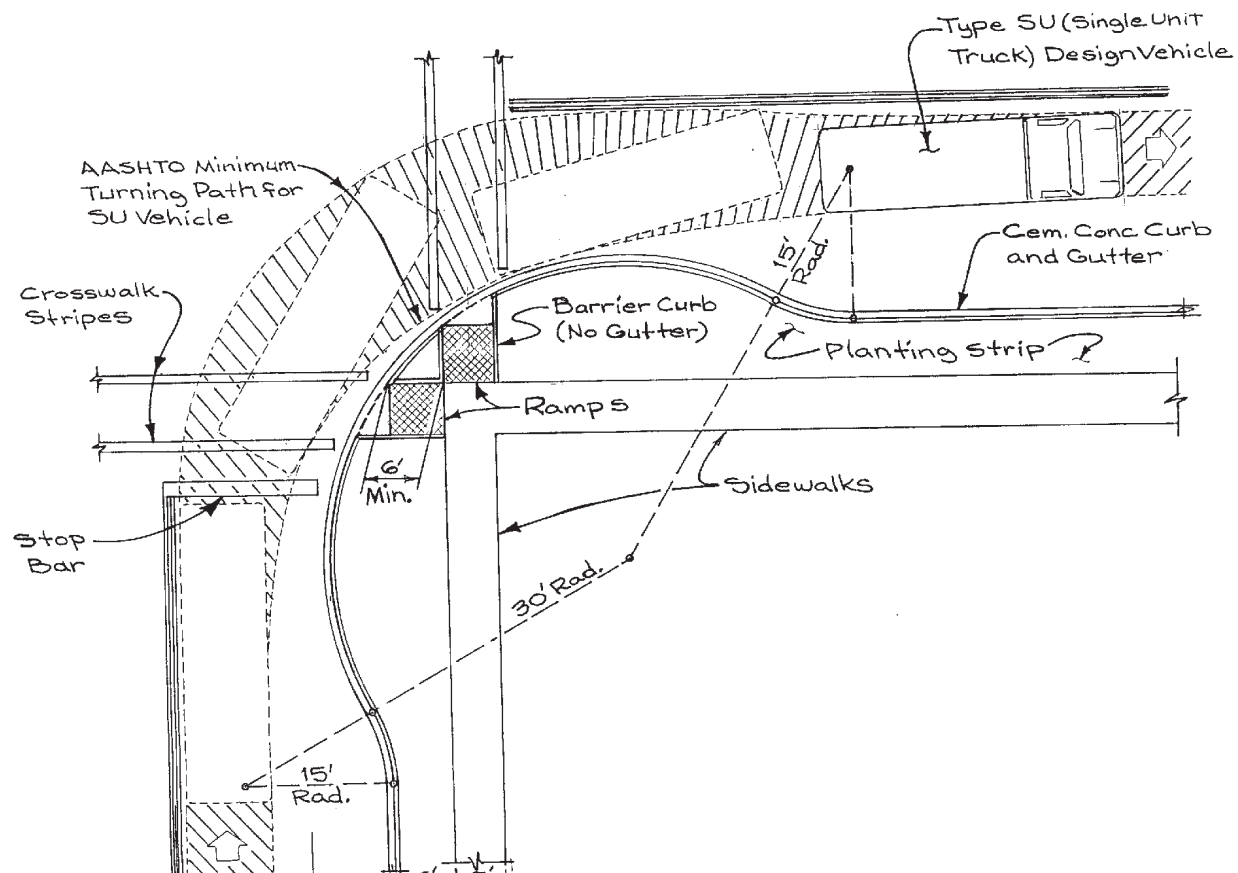


Figure 2-5
Plan — Example of a Design Vehicle Traffic Path

Another example of the effective use of the sidewalk bulb detail is illustrated in Figure 2-6 A&B. At this location the sidewalk has been constructed along the face of a building. This is a common condition within the central business district of a city. The sidewalk is only six feet wide and it would appear to be impossible to provide the required six-foot long ramp and the four-foot landing at this intersection without removing the building (Figure 2-6A).

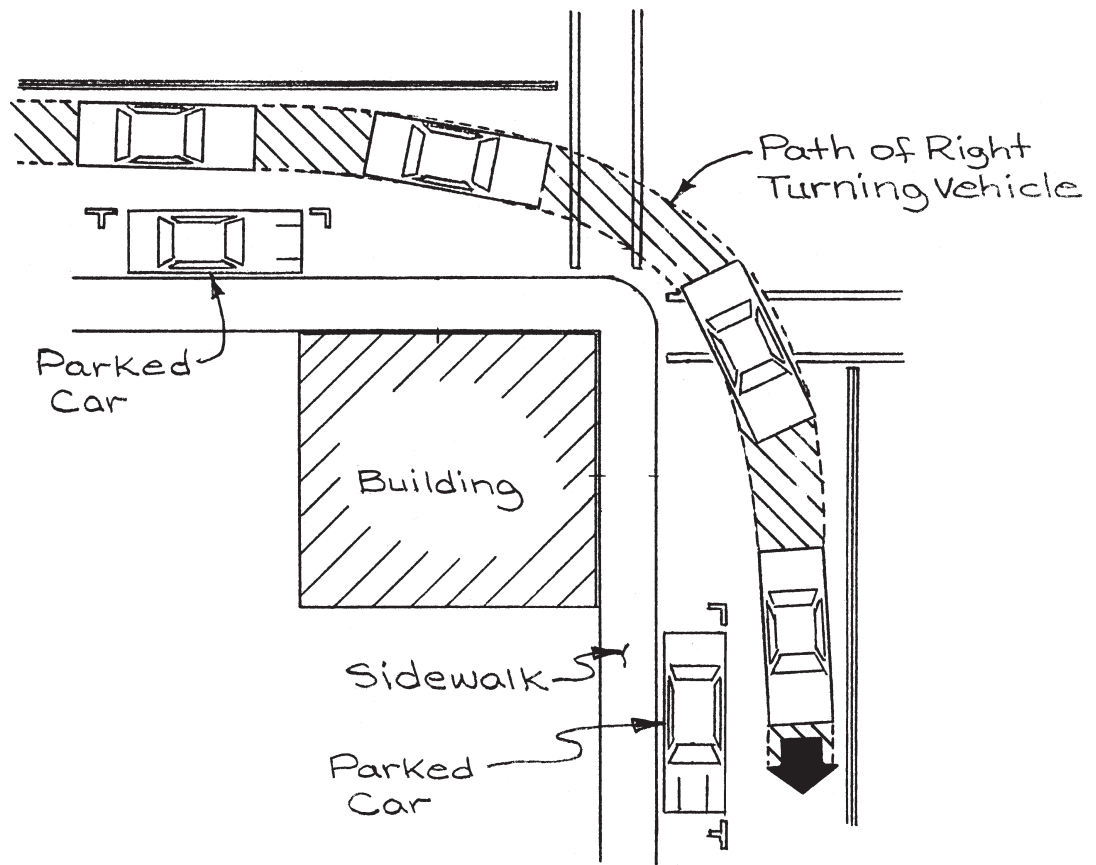


Figure 2-6A
Plan — An Example of a Design Vehicle Traffic Path

The solution is dependent upon the right-turn path of the vehicles at this intersection. Vehicle turning paths are not a constant radius curve. Vehicles actually follow a parabolic curve through the turn maneuver. This leaves large areas in which there is no vehicular traffic. In Figure 2-6B, the sidewalk bulb is constructed within this no traffic area.

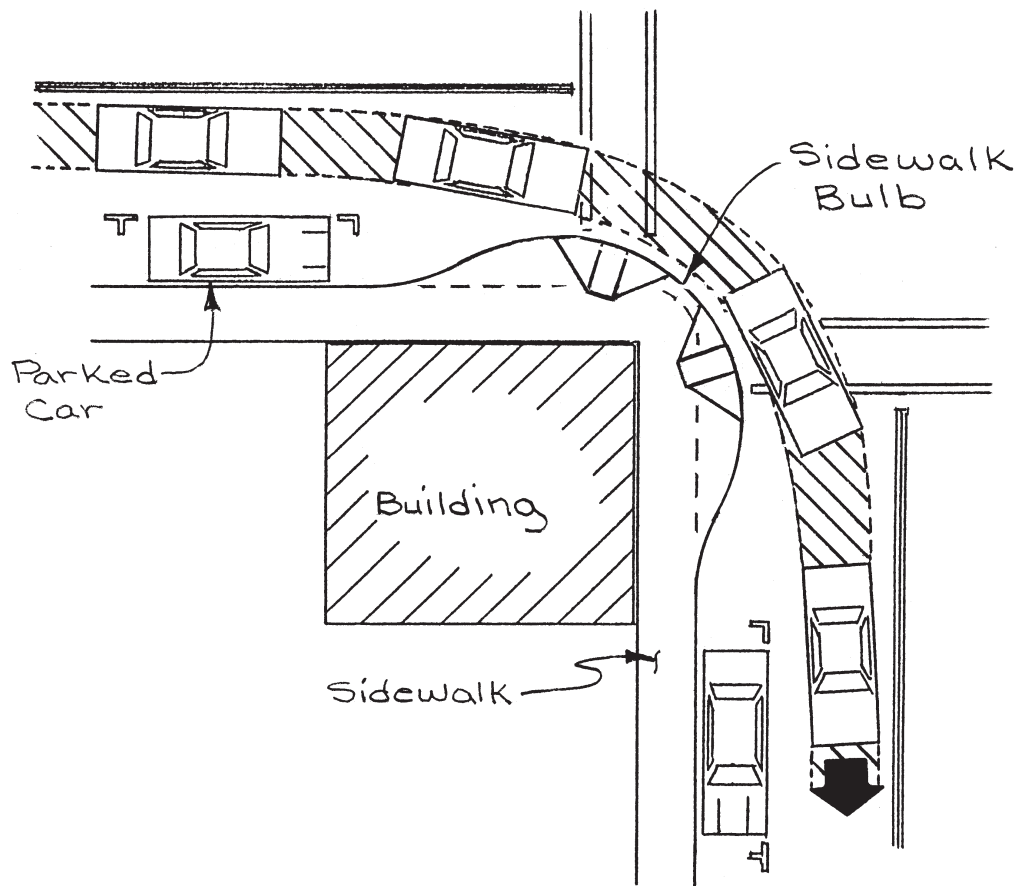


Figure 2-6B
Plan — Example of Traffic Path with Sidewalk Bulbs

The larger scale drawing in Figure 2-6C shows the required dimensions to construct the sidewalk ramps and landings in the sidewalk bulb. The ramps have been moved as close as possible to the apex of the curb curve. The corner of the building limits the motorist's line of sight and positioning the ramps closer together will place the pedestrians in a more visible location.

This detail has been based on the turning path of a passenger car. A modification of this detail would be necessary if a larger vehicle, such as a bus, regularly used this intersection.

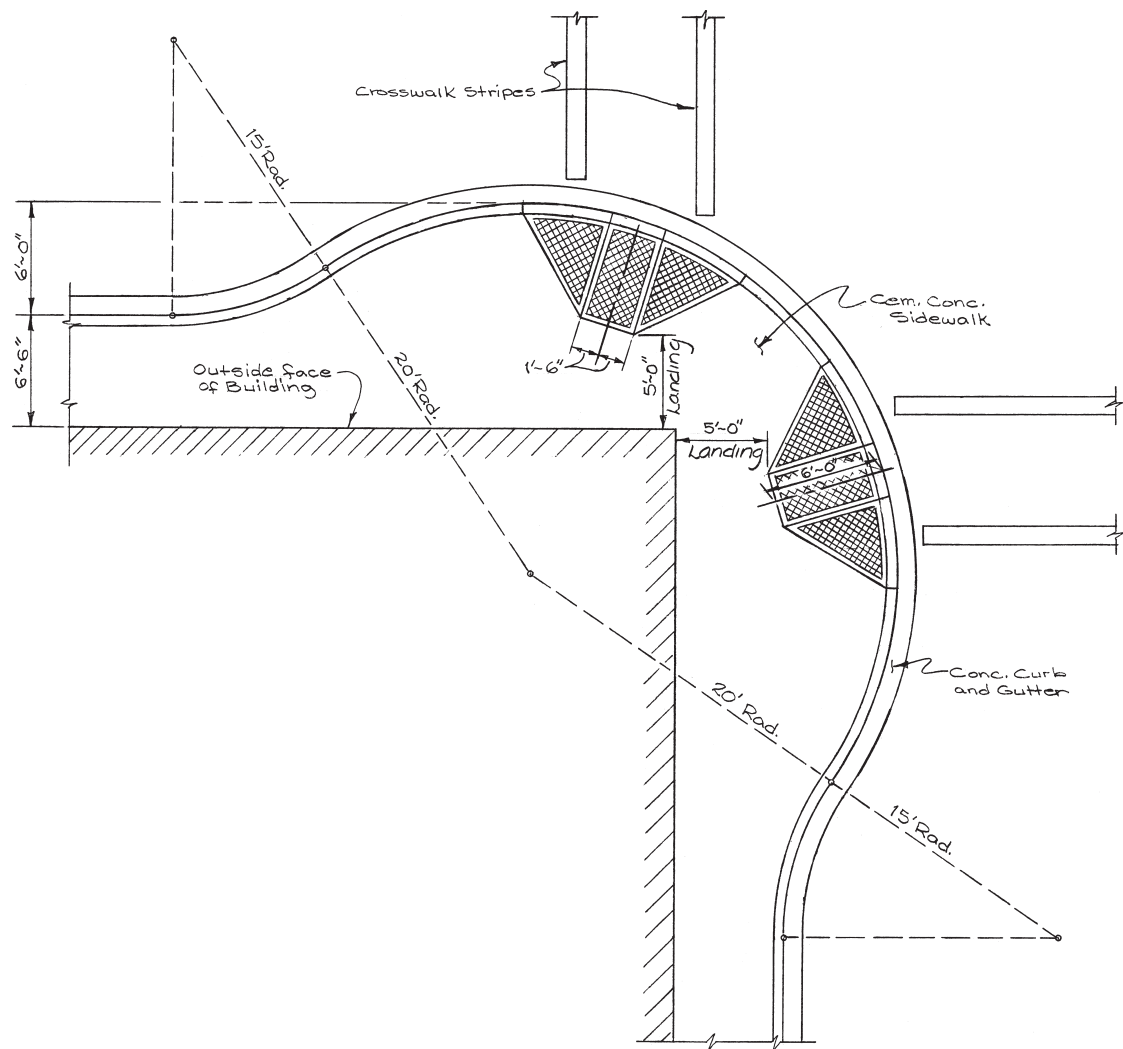


Figure 2-6C
Plan — Sidewalk Bulb Details

Sidewalk Ramp Detail C — Ramps Within the Curve Radius

Detail C, as shown in Figures 2-7A and 2-7B, differs from the two previous details in that it provides two ramps for separate crosswalks within the curb radius. The ramps are oriented to be in line with crosswalks that cross the street at about 90 degrees rather than in line with the radius. The ramps must be separated by at least three feet to provide full curb height at or near the apex of the curb curve. This provides some guidance for the right-turning vehicle and to some extent, protection for pedestrians standing on the sidewalk. The wide concrete area behind the ramps provides a wheelchair bypass route.

This detail requires a more exacting field location of the ramps to align with the crosswalks before construction. The length of the ramp varies somewhat because one side is longer than the other. The shortest side is six feet long to provide the one in 12 slope. The triangular area at the bottom of the ramp is level.

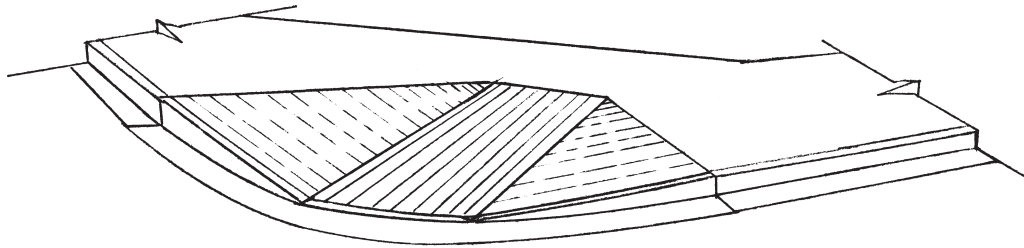


Figure 2-7A
Sidewalk Ramp Detail C

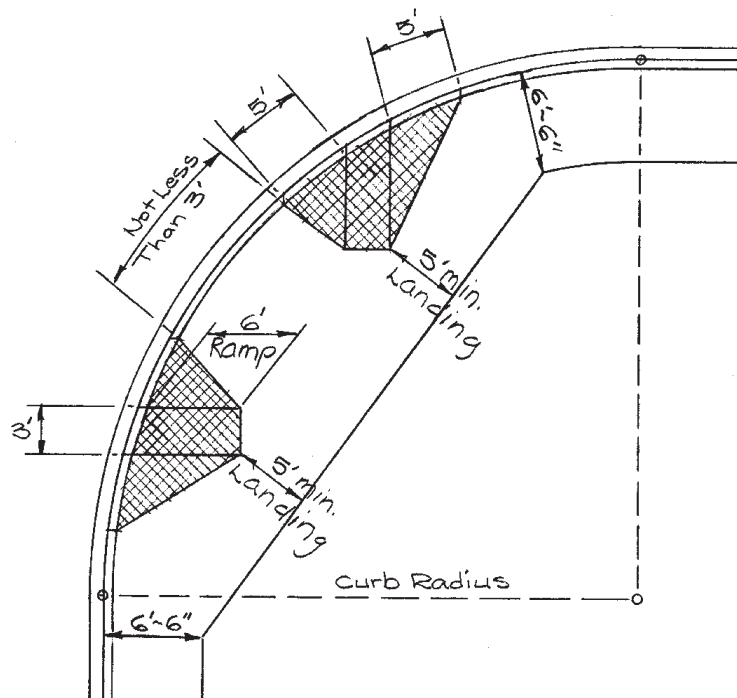


Figure 2-7B
Sidewalk Ramp Detail C

Difficulties arise in using this detail at intersections which do not have symmetrical lane arrangements. This condition is illustrated in the intersection plan shown in Figure 2-8. The ramps in the lower left and upper right quadrants are separated by the required three feet of full curb height. The positioning of the crosswalks at 90 degrees to the roadway and the asymmetrical lane configuration greatly affects the location of the ramps in the other two quadrants. The stop bar for vehicular traffic in the upper left quadrant is positioned quite far from the intersection and the time required to cross the intersection is significantly higher than that required for the other legs. This somewhat remote location could impose sight distance problems for these vehicles. In particular, the crosswalk on the left side of the intersection is in a location where right-turning vehicles may not be able to see the pedestrians clearly. Note also that the separation between the two ramps in the upper left quadrant will require an extremely large expanse of concrete to provide the wheelchair bypass route.

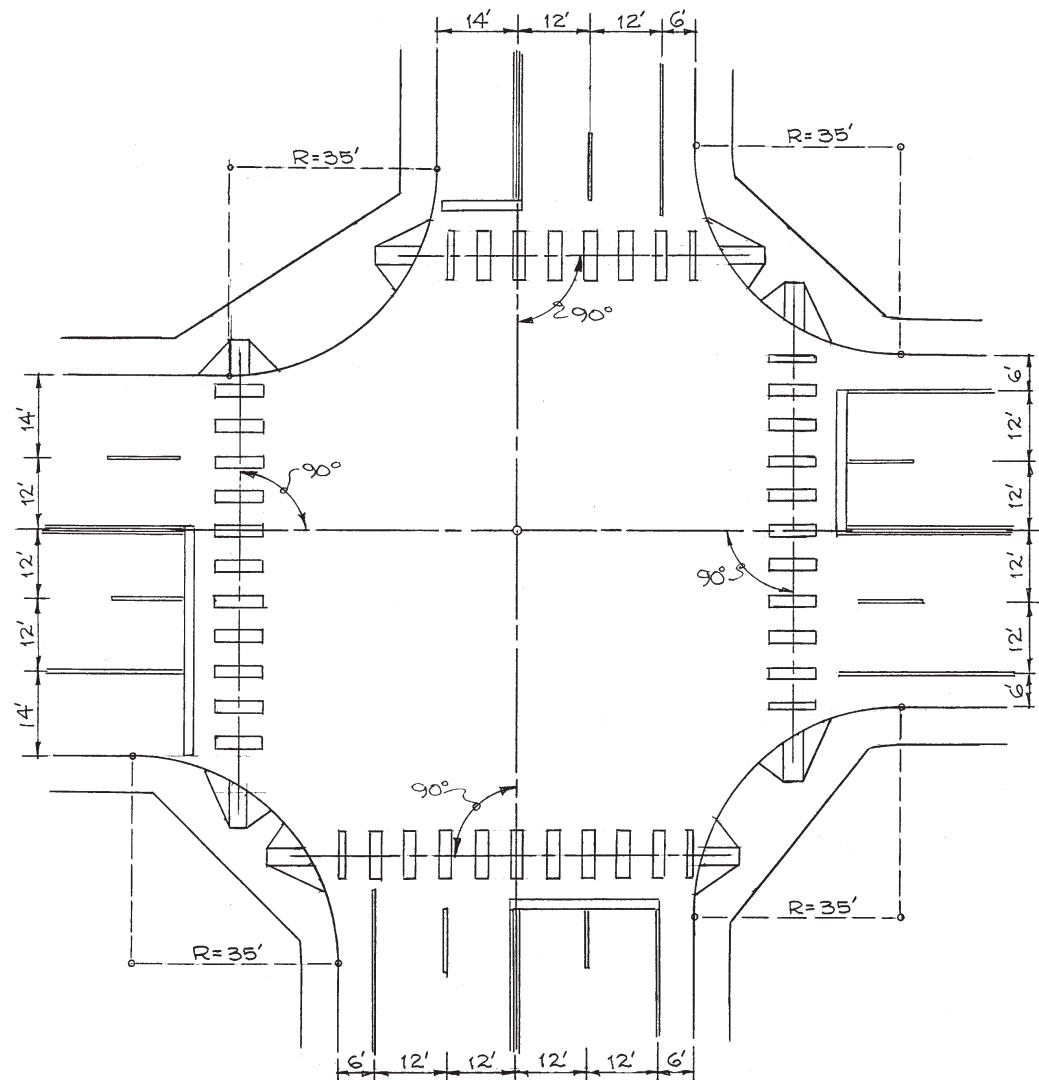


Figure 2-8
Typical Intersection Plan with Asymmetrical
Lane Arrangements

Sidewalk Ramp Detail D — Ramping the Entire Sidewalk

This detail ramps the entire sidewalk down to the level of the roadway. A concrete curb at the back of the sidewalk prevents shoulder embankment material from eroding onto the ramps and landing. Also, since this ramp is constructed on radial lines emanating from the radius point of the curb curve, the dimensions at the face of the curb will be larger than those at the back of the sidewalk. The drawings below show these details. A simple chart for determining the dimensions of the ramp at the curb face using varying radii is provided with Figure 2-9B.

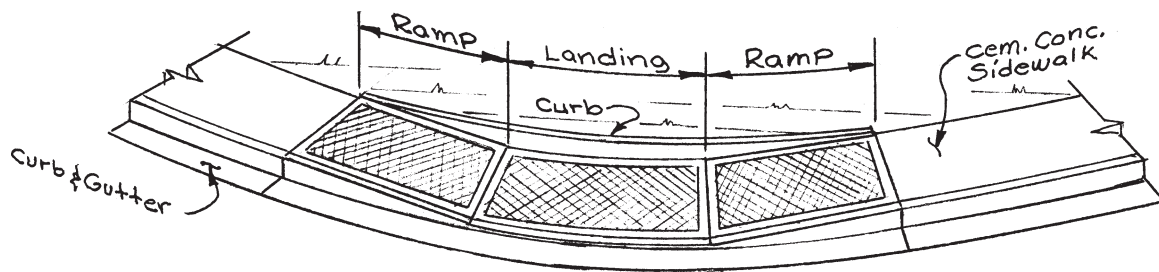
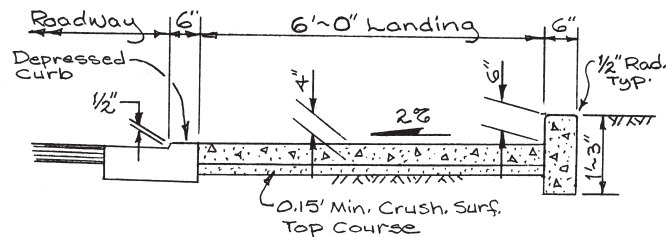
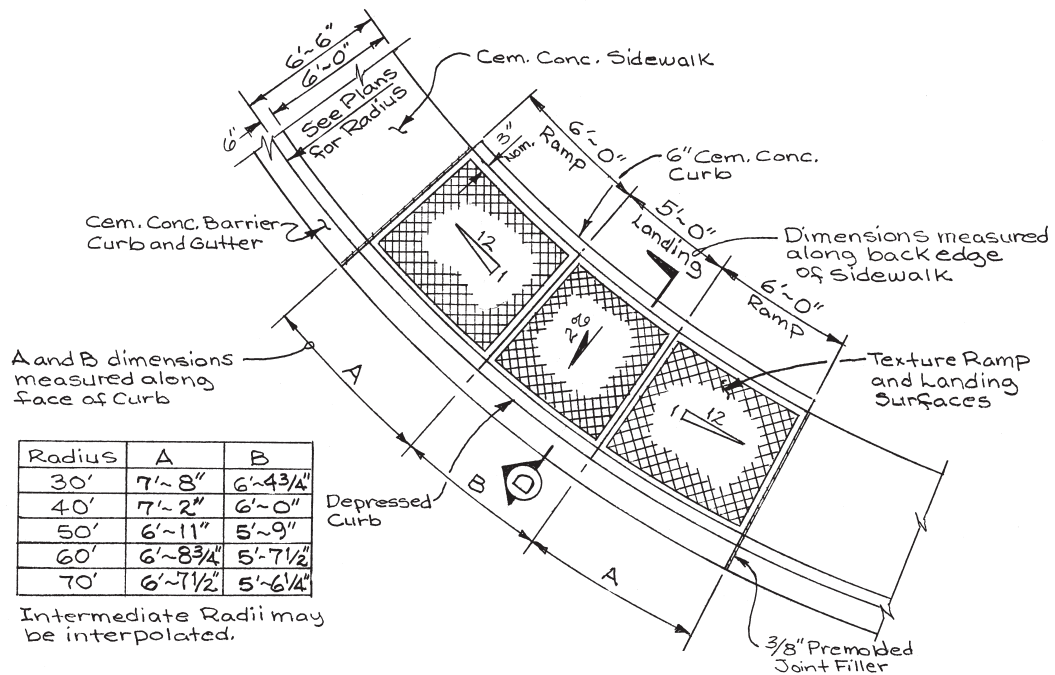


Figure 2-9 View — Sidewalk Ramp Detail D



Cross-Section Figure 2-9A
Section — Sidewalk Ramp — Detail D

Figure 2-9B
Plan — Sidewalk Ramp — Detail D



In the intersection example in Figure 2-10, the Sidewalk Ramp Detail D is used to provide a common landing where two crosswalks converge. This type of intersection detail would be common where a traffic signal system controls the vehicular and pedestrian movements.

The crosswalks have been placed fairly close to the intersection. This results in longer pedestrian crossing distances. Longer crossing distances could expose the pedestrian to possible conflicts with vehicular traffic for longer periods of time. This intersection, however, has 55-foot curb radii and the crosswalks would need to be located to the beginnings of the curves to produce a significant reduction in the crossing distances. And this would, in turn, move the stop bars farther away from the intersection, producing much longer vehicular crossing distances. Longer vehicular crossing distances increased signal cycle lengths and vehicle delays, which were undesirable in this intersection detail. The landings and the crosswalks, however, are positioned well for visibility to right-turning vehicles. This is a satisfactory trade-off for the longer crosswalk distances.

The exclusive right-turn lane in the southwest quadrant is not controlled by the traffic signal and will move freely into a separate traffic lane on the south leg of the intersection. In this case, a raised traffic island is provided as a pedestrian refuge. The size of the island is relatively small and will not accommodate the three 6-foot long ramps and a central 4-foot wide landing necessary for the three crosswalks that converge at this location. It is necessary, in this situation, to provide passageways through the island at the pavement surface level to eliminate the need for the ramps.

Sidewalk Ramp Detail D — Typical

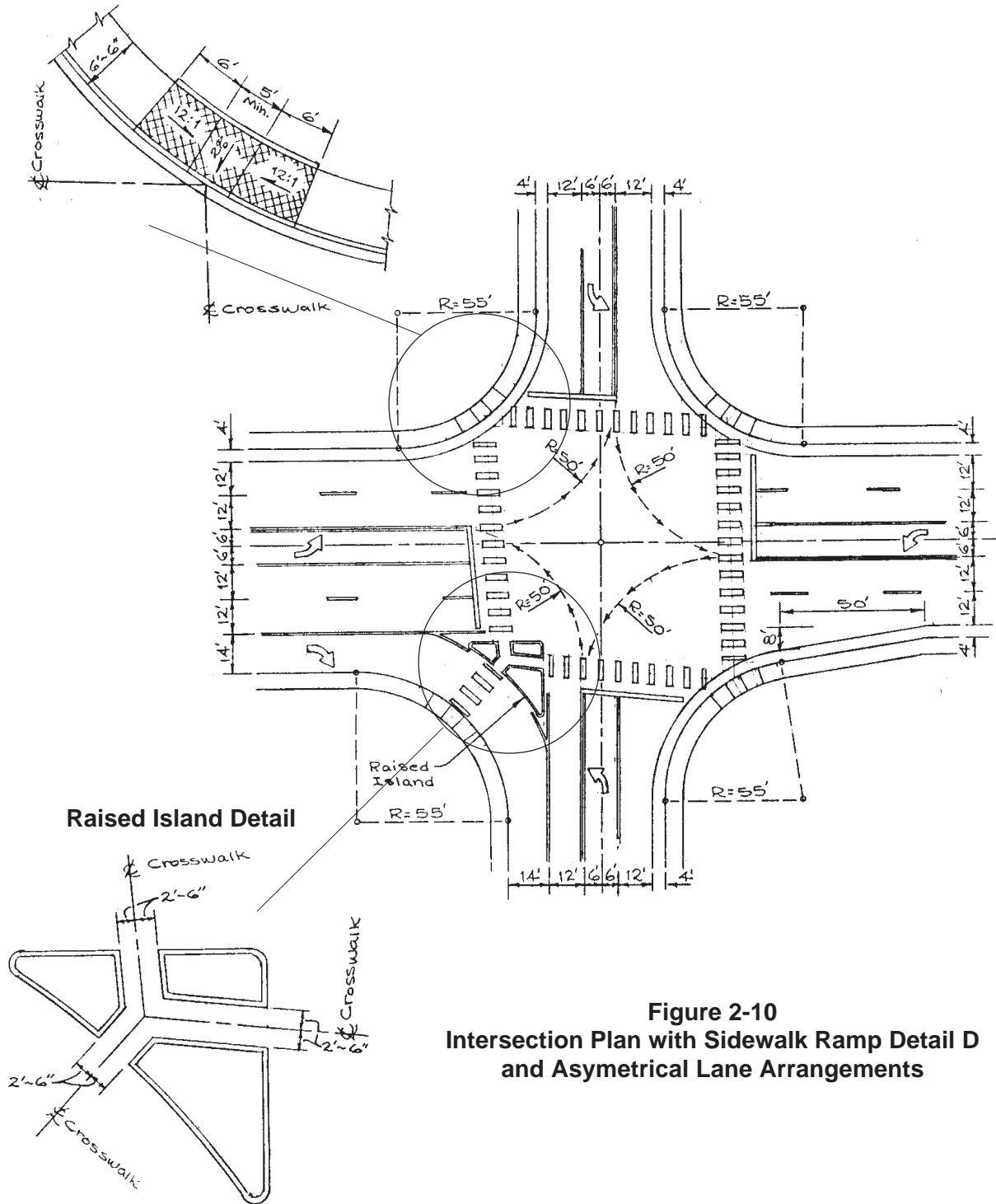


Figure 2-10
Intersection Plan with Sidewalk Ramp Detail D
and Asymmetrical Lane Arrangements

Sidewalk Ramp Detail E — Dual Ramps with Bypasses

This detail (Figures 2-11 and 2-12) provides a ramp within the area of the curb radius. A 5-foot landing is provided at the end of the ramp to facilitate the wheelchair. The sidewalk also tapers from this landing to the standard 6-foot wide sidewalk section and provides a bypass route for wheelchair occupants. The dual sidewalk ramp detail should be used when the two crosswalks do not terminate at a common point.

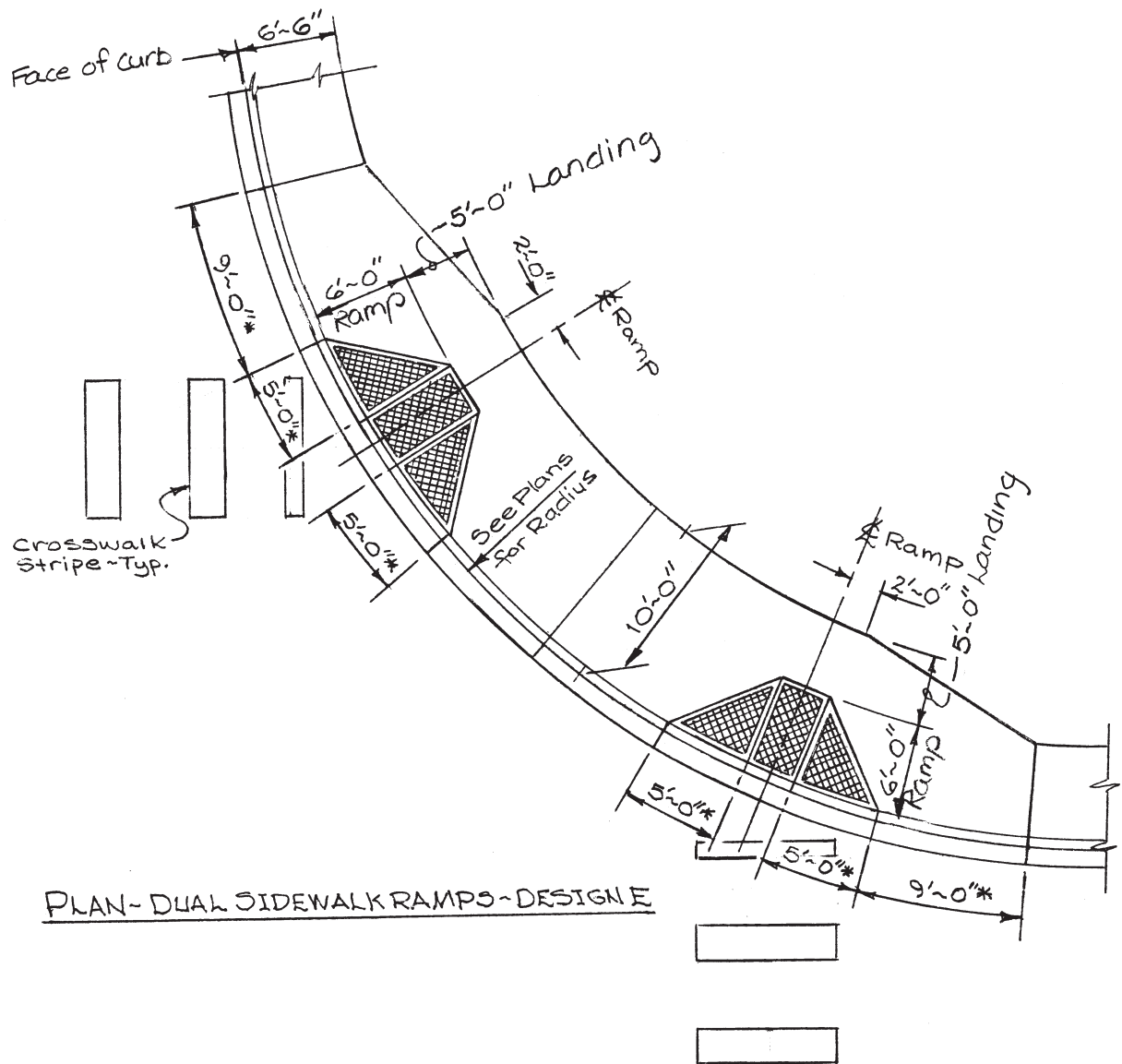


Figure 2-11
Plan — Dual Sidewalk Ramps — Detail E

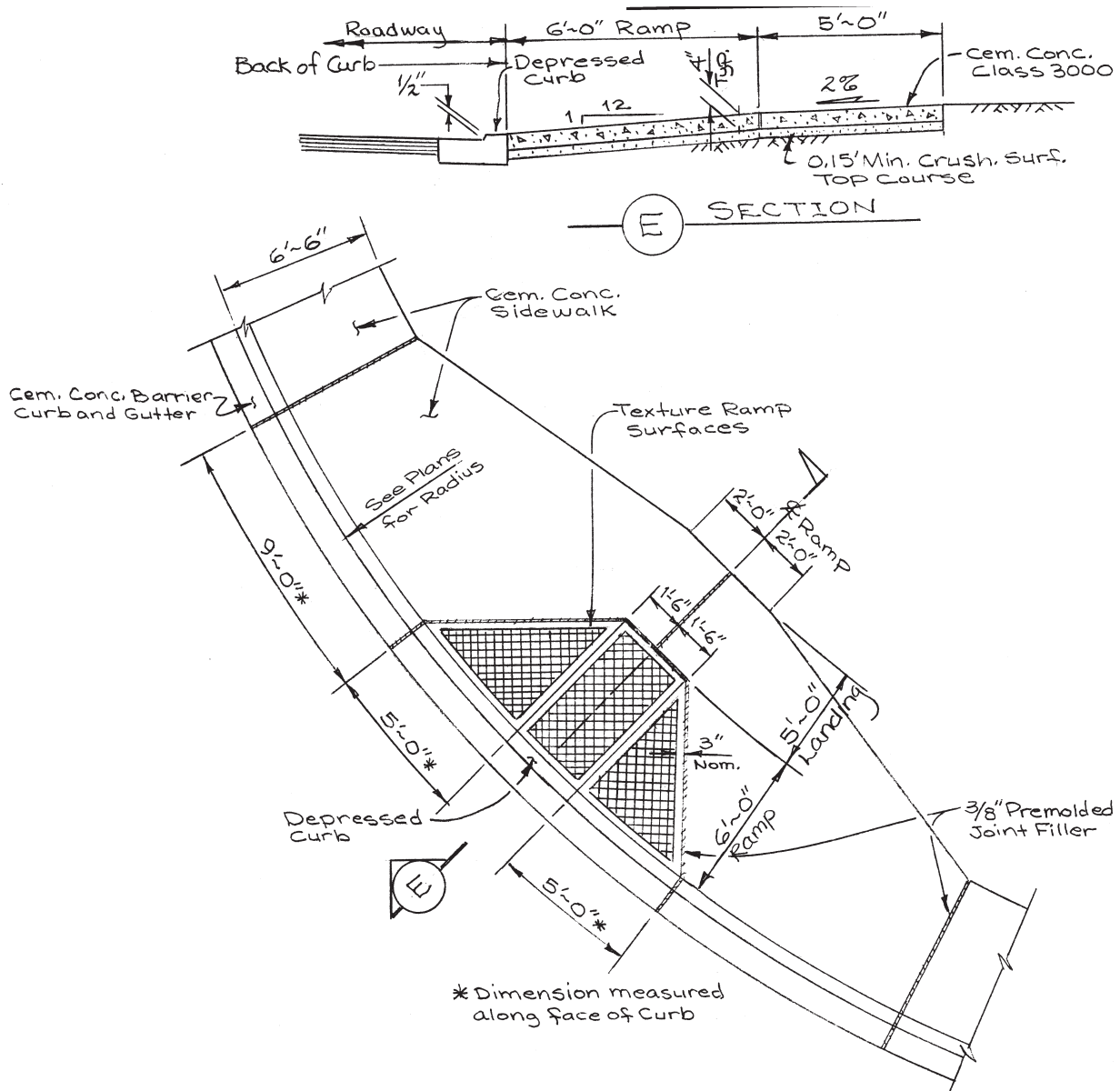


Figure 2-12
Plan — Sidewalk Ramp — Detail E

The Sidewalk Ramp Detail D has some disadvantages which should be considered when laying out an intersection. The 4-foot landing provides limited space for pedestrians waiting to cross a street. Also, when this landing is occupied, it may be difficult for people in wheelchairs to get through in order to resume their journey on the sidewalk.

Detail E, with its separate bypass route around the ramp and larger area for pedestrian waiting, may be a better selection if sufficient right-of-way is available. The intersection plan below (Figure 2-13) uses the Detail E sidewalk ramps and has the same configuration as that shown for the Detail D application discussed previously.

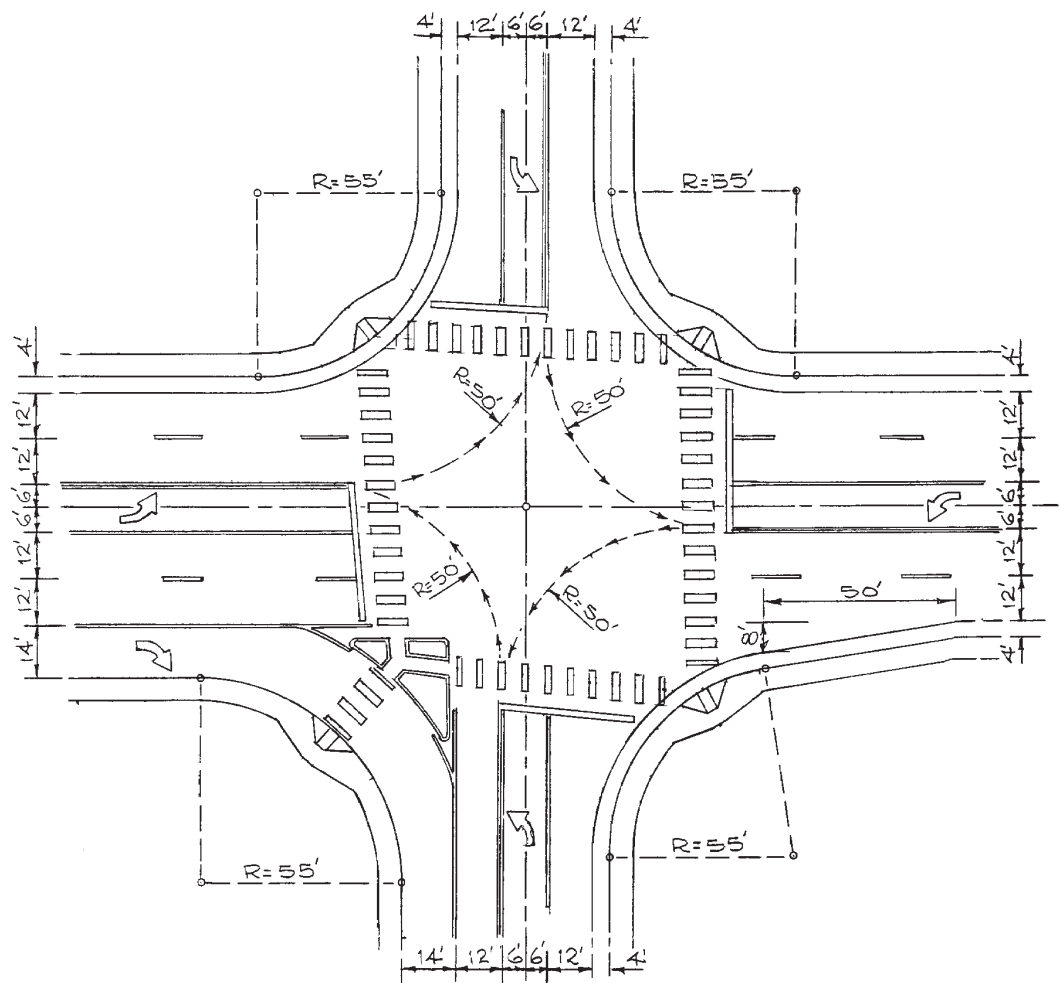


Figure 2-13
Typical Intersection Plan with Sidewalk Ramp Detail E
and Asymmetrical Lane Arrangements

Sidewalk Ramp Detail F — Parallel Ramps

At certain locations, such as “Tee” intersections and diamond interchange ramp terminals, a single crosswalk parallel to the major street may be desired. Accessibility can be provided by using the Sidewalk Ramp Detail E. This detail would position the ramp radial to the curb curve and would require the 4-foot wide landing at the top of the ramp.

Another detail that would provide a simple ramp parallel to the roadway, may be more appropriate at these locations. This detail is identified as Sidewalk Ramp Detail F. Figure 2-14A below shows these two ramps. Figure 2-14B on the following page shows design and construction details for the parallel ramp. This detail routes the sidewalk away from the adjacent curb. Then it ramps the sidewalk down to the roadway surface of the side street. Two 6-inch curbs, one on each side of the ramp, prevent shoulder embankment material from eroding onto the ramp.

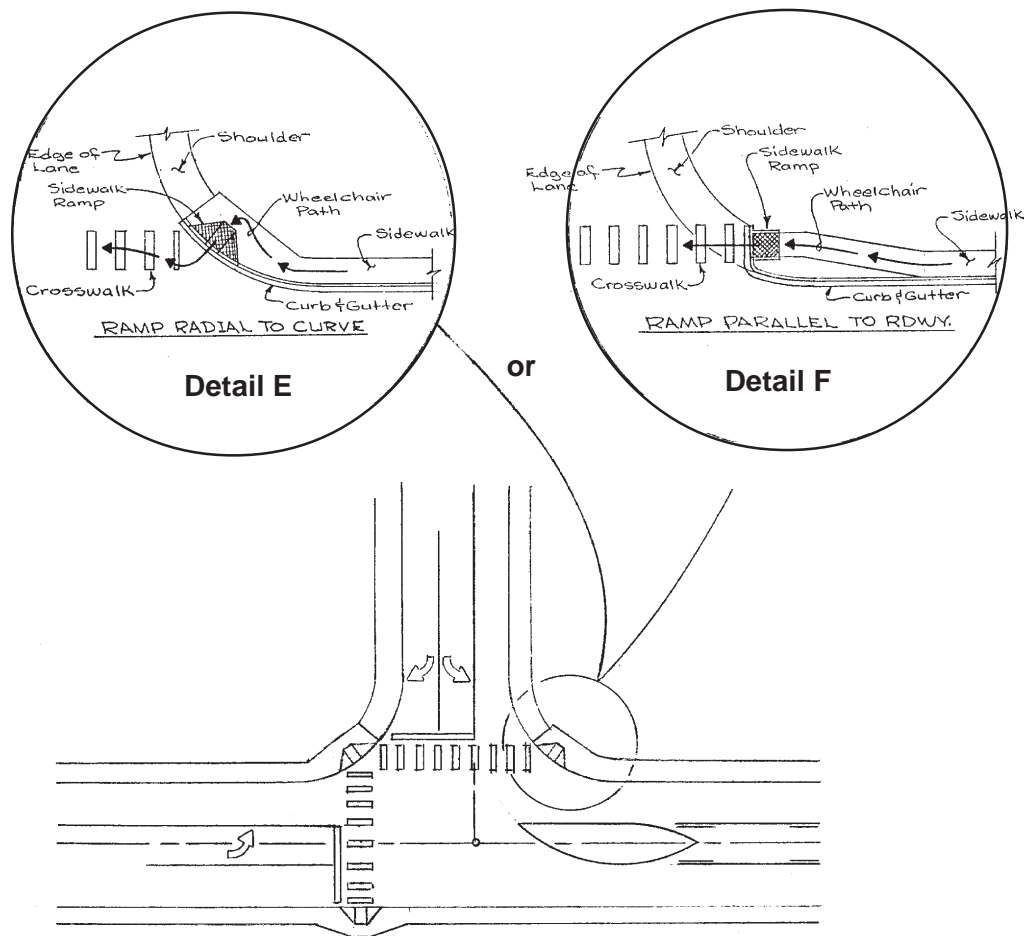


Figure 2-14A
Typical Tee Intersection Plan

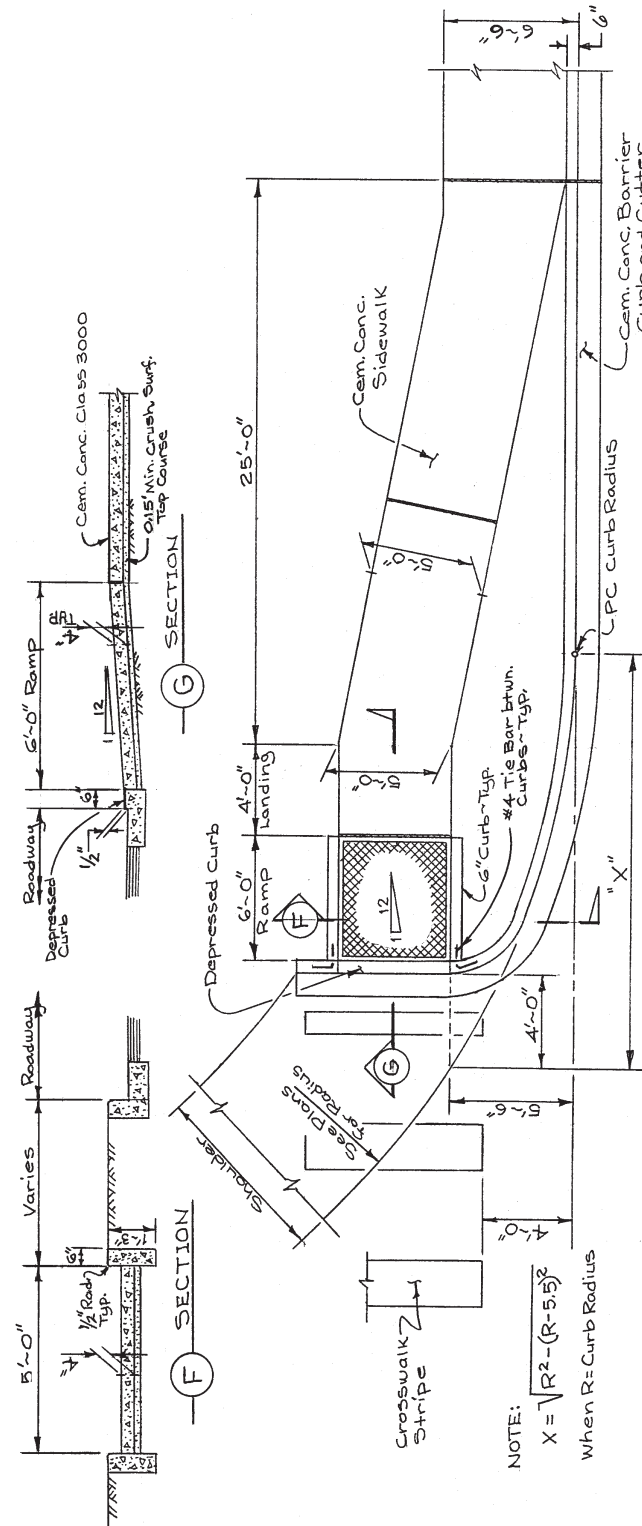


Figure 2-14B
Plan — Sidewalk Ramp Parallel to Roadway — Detail F

The drawing in Figure 2-15 depicts another method of providing a parallel sidewalk ramp at a ramp terminal. The concrete curb and sidewalk are simply ramped down to the pavement surface. This drawing depicts the overall layout of the intersection and includes the raised traffic island, crosswalks, and other details necessary to provide a barrier-free pedestrian route.

This intersection could have a traffic signal installation, and the location of the pedestrian actuation buttons must be considered. The pedestrian push buttons are usually attached to the signal standards and they must be located at points readily accessible to people in wheelchairs.

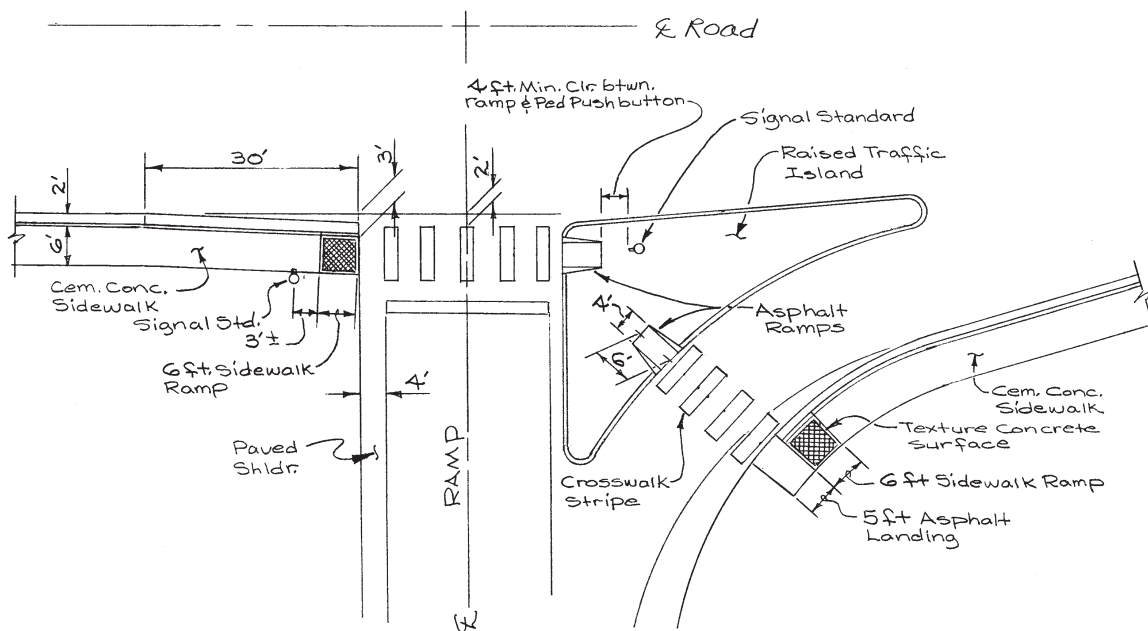


Figure 2-15
Plan — Example of a Parallel Sidewalk Ramp
Parallel at Ramp Terminal

Sidewalk Ramp Detail D — Typical

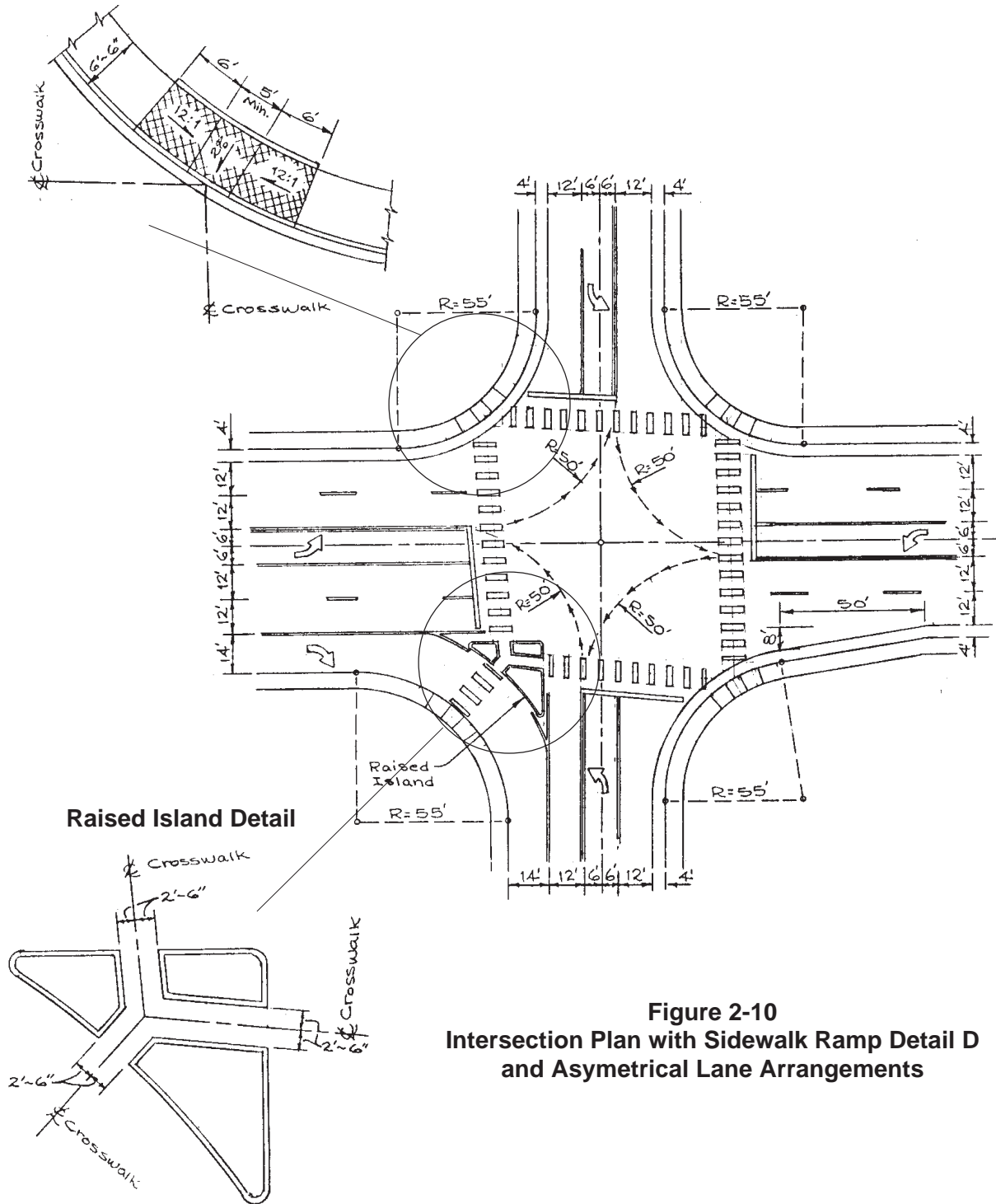


Figure 2-10
Intersection Plan with Sidewalk Ramp Detail D
and Asymmetrical Lane Arrangements

Sidewalk Ramp Detail E — Dual Ramps with Bypasses

This detail (Figures 2-11 and 2-12) provides a ramp within the area of the curb radius. A 5-foot landing is provided at the end of the ramp to facilitate the wheelchair. The sidewalk also tapers from this landing to the standard 6-foot wide sidewalk section and provides a bypass route for wheelchair occupants. The dual sidewalk ramp detail should be used when the two crosswalks do not terminate at a common point.

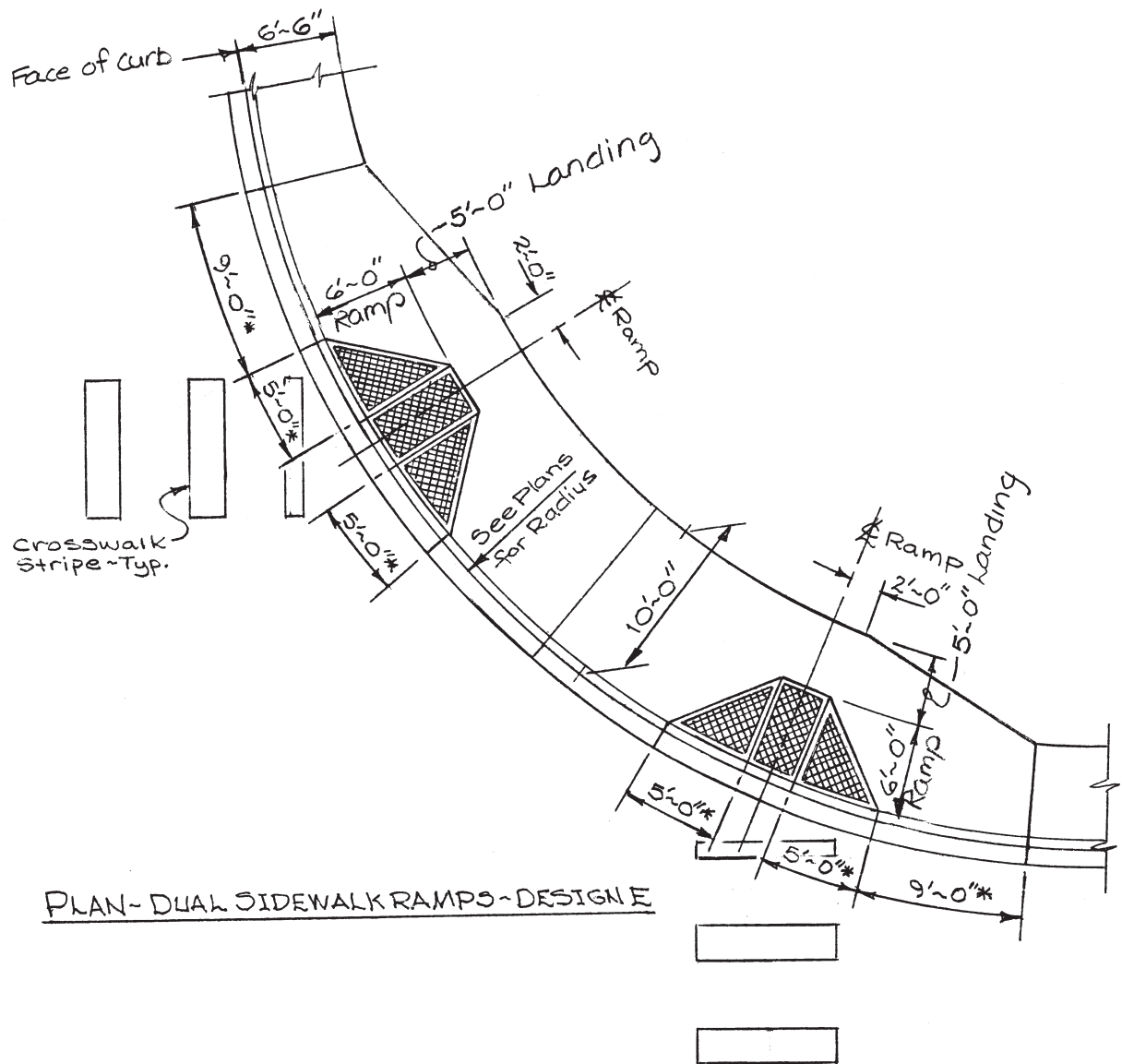


Figure 2-11
Plan — Dual Sidewalk Ramps — Detail E

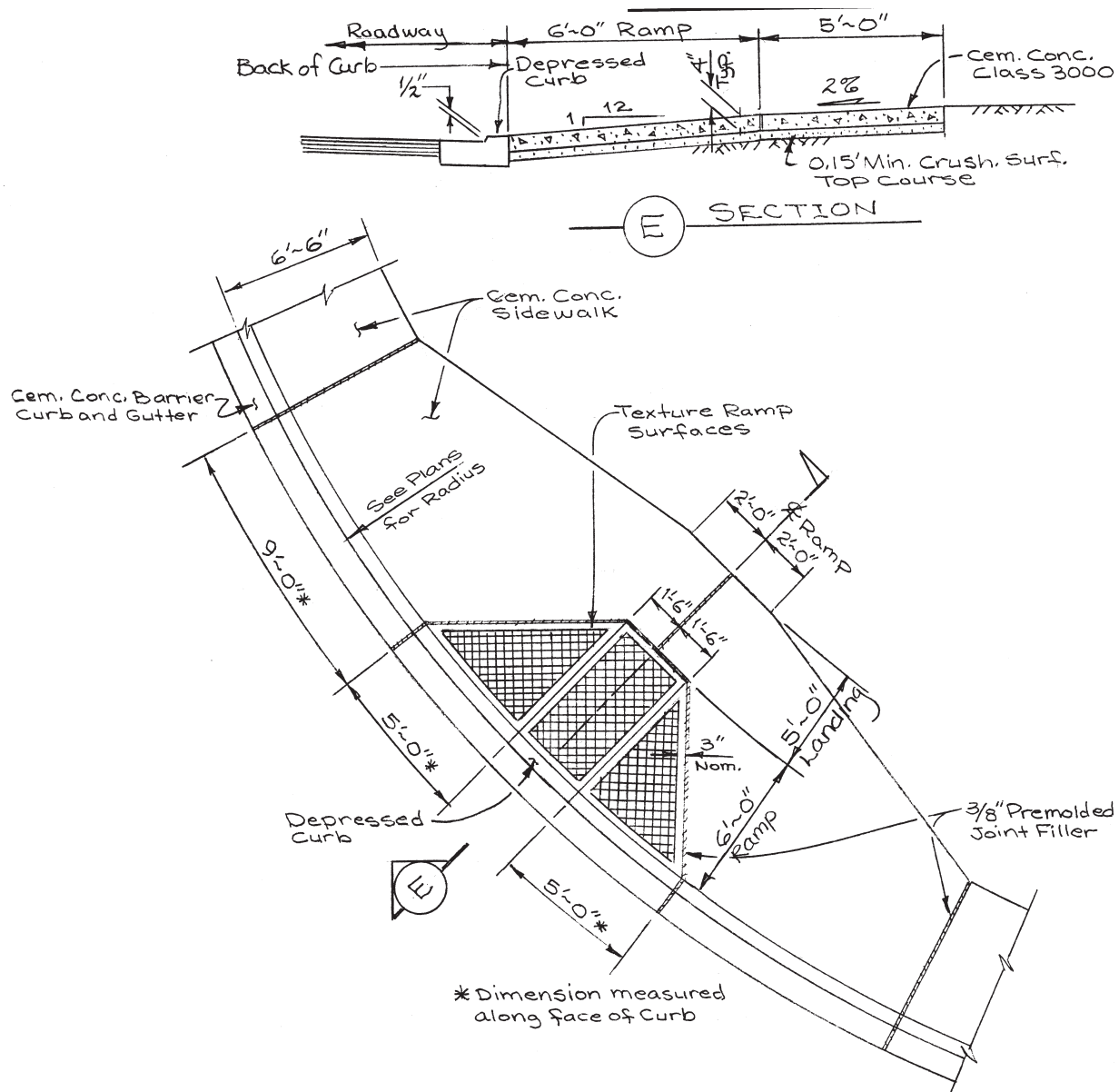


Figure 2-12
Plan — Sidewalk Ramp — Detail E

The Sidewalk Ramp Detail D has some disadvantages which should be considered when laying out an intersection. The 4-foot landing provides limited space for pedestrians waiting to cross a street. Also, when this landing is occupied, it may be difficult for people in wheelchairs to get through in order to resume their journey on the sidewalk.

Detail E, with its separate bypass route around the ramp and larger area for pedestrian waiting, may be a better selection if sufficient right-of-way is available. The intersection plan below (Figure 2-13) uses the Detail E sidewalk ramps and has the same configuration as that shown for the Detail D application discussed previously.

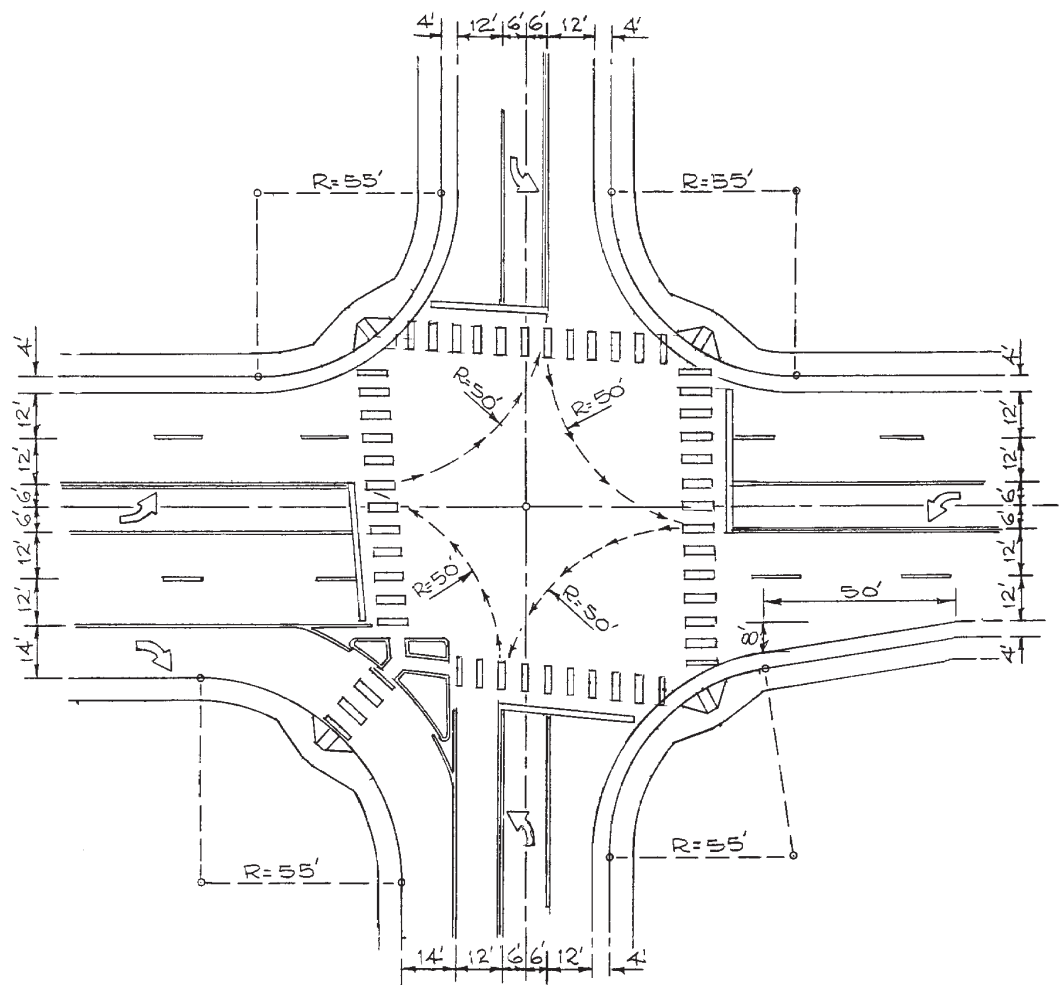


Figure 2-13
Typical Intersection Plan with Sidewalk Ramp Detail E
and Asymmetrical Lane Arrangements

Sidewalk Ramp Detail F — Parallel Ramps

At certain locations, such as “Tee” intersections and diamond interchange ramp terminals, a single crosswalk parallel to the major street may be desired. Accessibility can be provided by using the Sidewalk Ramp Detail E. This detail would position the ramp radial to the curb curve and would require the 4-foot wide landing at the top of the ramp.

Another detail that would provide a simple ramp parallel to the roadway, may be more appropriate at these locations. This detail is identified as Sidewalk Ramp Detail F. Figure 2-14A below shows these two ramps. Figure 2-14B on the following page shows design and construction details for the parallel ramp. This detail routes the sidewalk away from the adjacent curb. Then it ramps the sidewalk down to the roadway surface of the side street. Two 6-inch curbs, one on each side of the ramp, prevent shoulder embankment material from eroding onto the ramp.

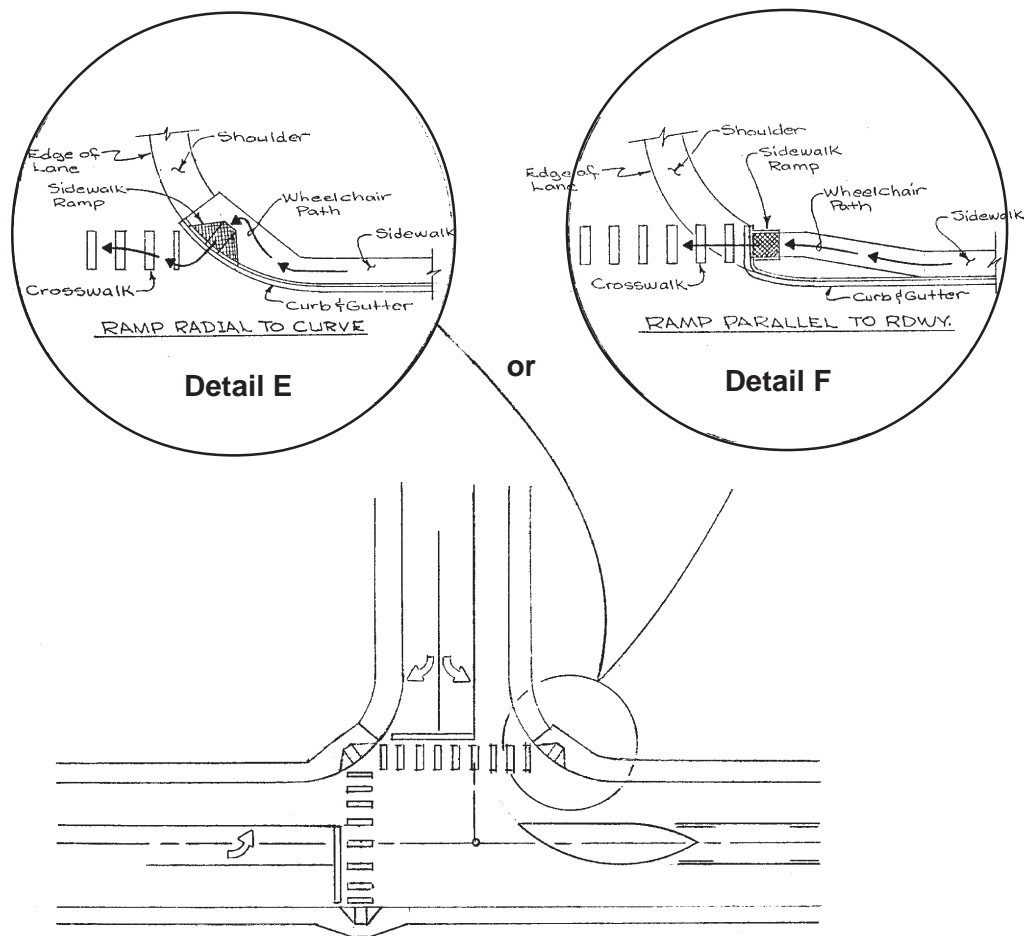


Figure 2-14A
Typical Tee Intersection Plan

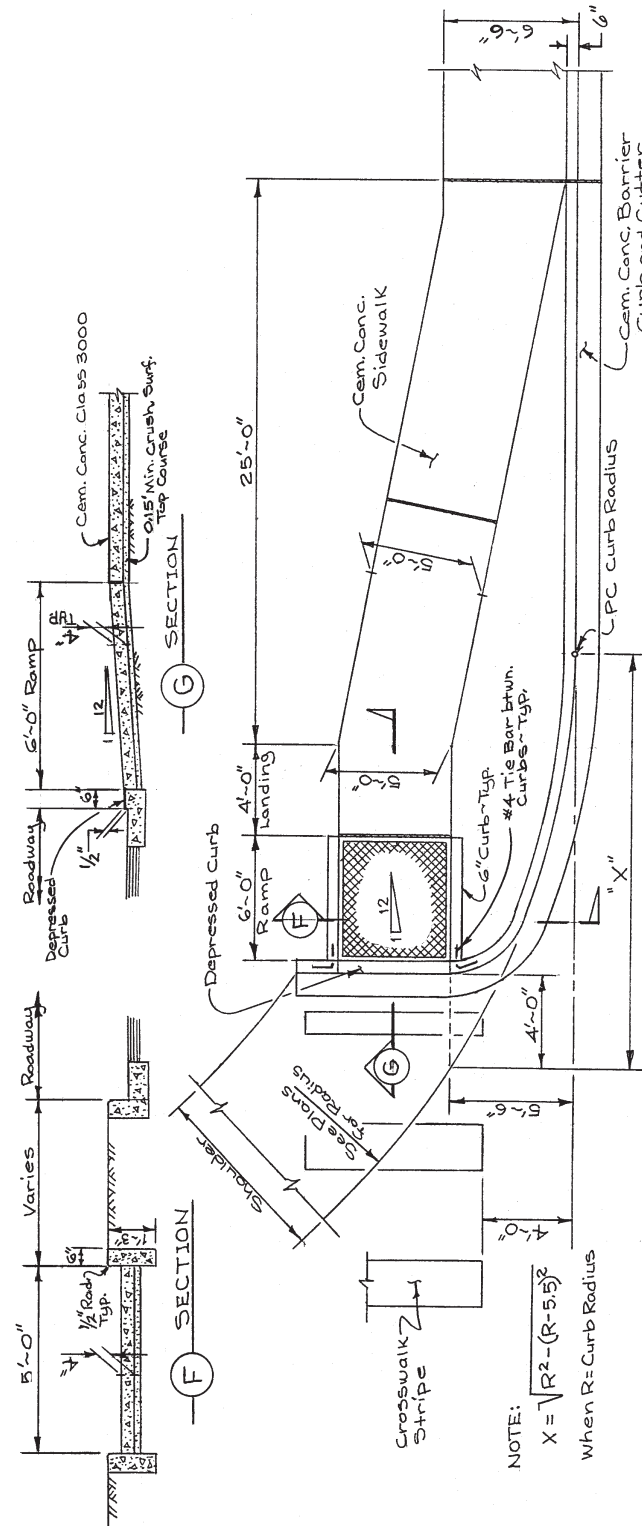


Figure 2-14B
Plan — Sidewalk Ramp Parallel to Roadway — Detail F

The drawing in Figure 2-15 depicts another method of providing a parallel sidewalk ramp at a ramp terminal. The concrete curb and sidewalk are simply ramped down to the pavement surface. This drawing depicts the overall layout of the intersection and includes the raised traffic island, crosswalks, and other details necessary to provide a barrier-free pedestrian route.

This intersection could have a traffic signal installation, and the location of the pedestrian actuation buttons must be considered. The pedestrian push buttons are usually attached to the signal standards and they must be located at points readily accessible to people in wheelchairs.

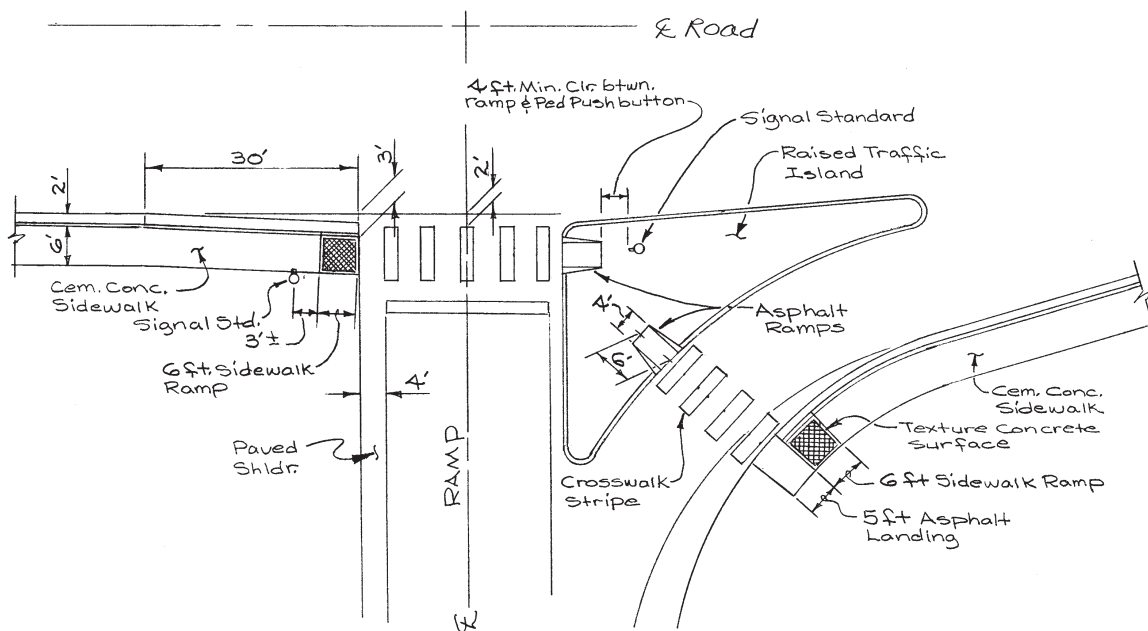
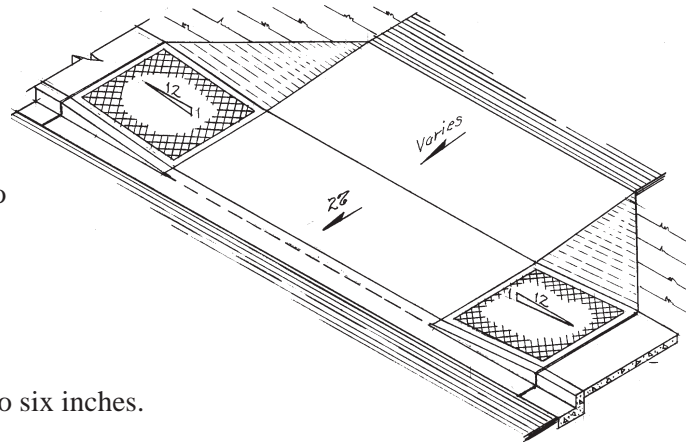


Figure 2-15
Plan — Example of a Parallel Sidewalk Ramp
Parallel at Ramp Terminal

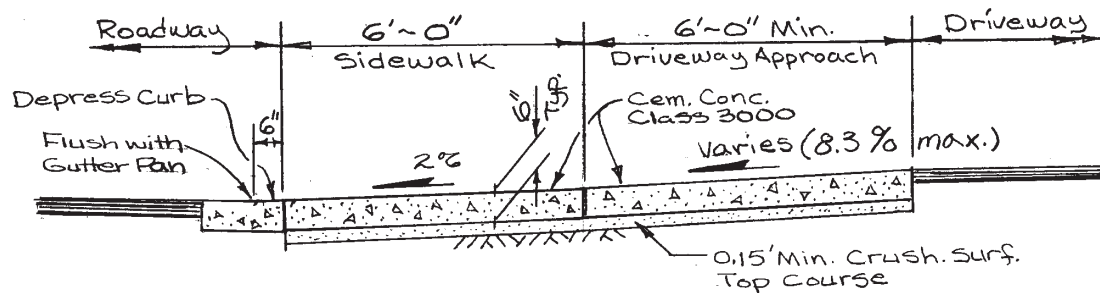
Driveway Approach Detail A — Parallel Sidewalk

Driveway Approach Detail A — Parallel Sidewalk

In this detail, the sidewalk is located next to the curb and cannot be routed around the approach due to restrictive right of way. The sidewalk is ramped down to the pavement surface on both sides of the approach. The sidewalk actually begins behind the sidewalk. This treatment is somewhat similar to Sidewalk Ramp Detail D. The sidewalk within the path of the vehicles using this approach must be thickened to six inches.



View



Section — Driveway Approach Detail A

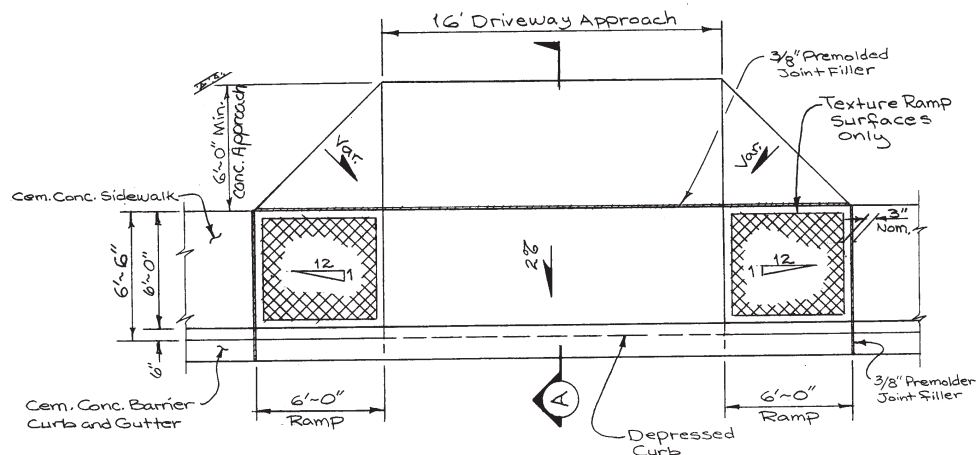


Figure 3-1
Plan — Driveway Approach Detail A

Small triangular concrete aprons between the sidewalk ramps and the approach are required to prevent erosion. The maximum grade of the approach should not exceed 8.3 percent. This corresponds with the 1 in 12 slope required for wheelchair accessibility and provides access from the approach to the sidewalk.

Driveway Approach Detail B — Routed Sidewalk

In this case the sidewalk is also located adjacent to the curb, but there is sufficient room to provide a route around the approach. The 14-foot long portion of the sidewalk which will be subjected to vehicular traffic must be thickened to 6 inches. Also, the slope of the approach between the sidewalk and the roadway should not exceed 8.3 percent if wheelchair access from the street to the sidewalk is desired.

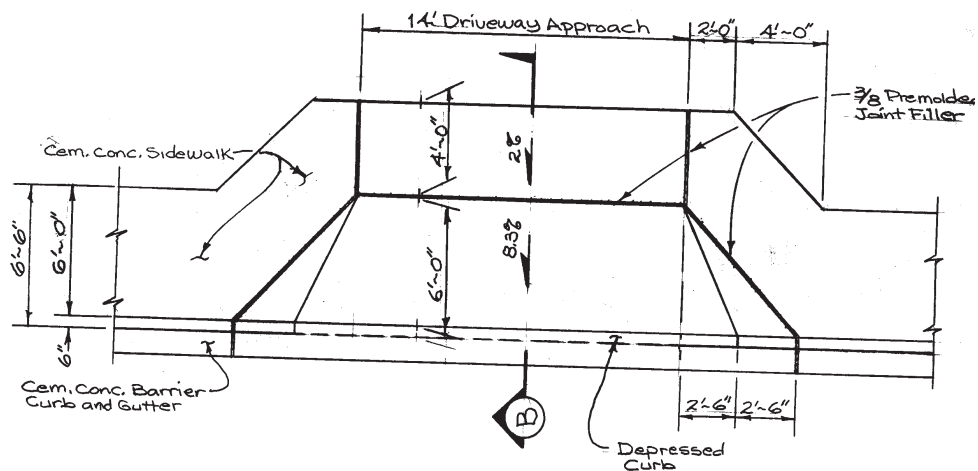
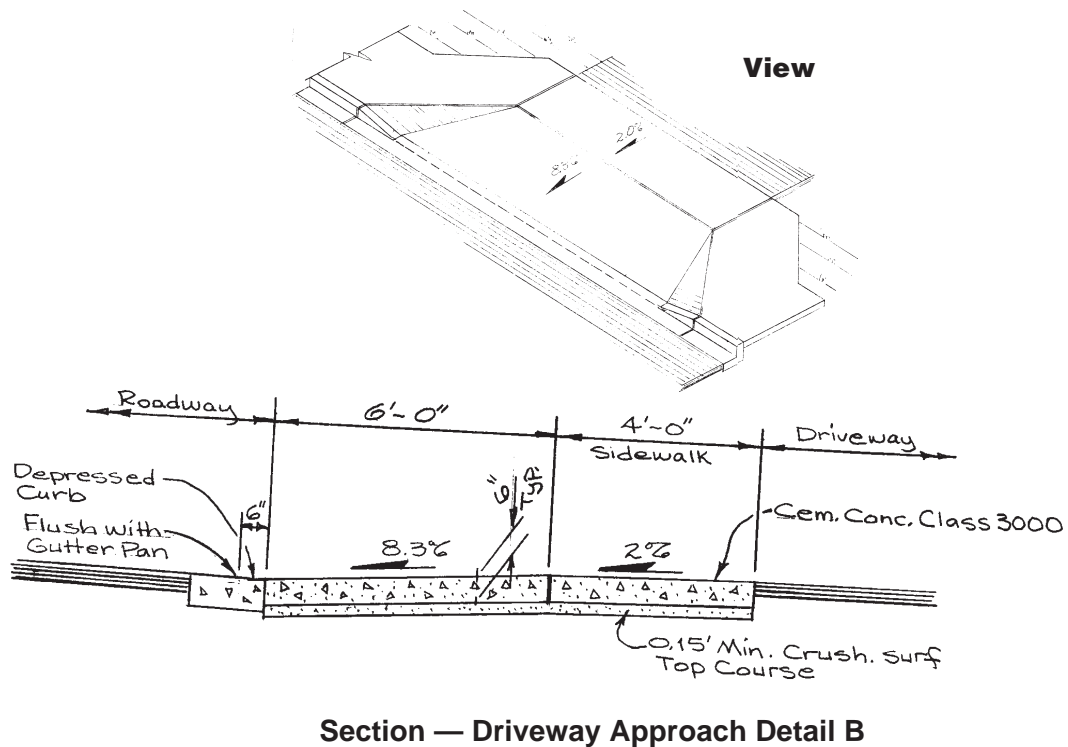
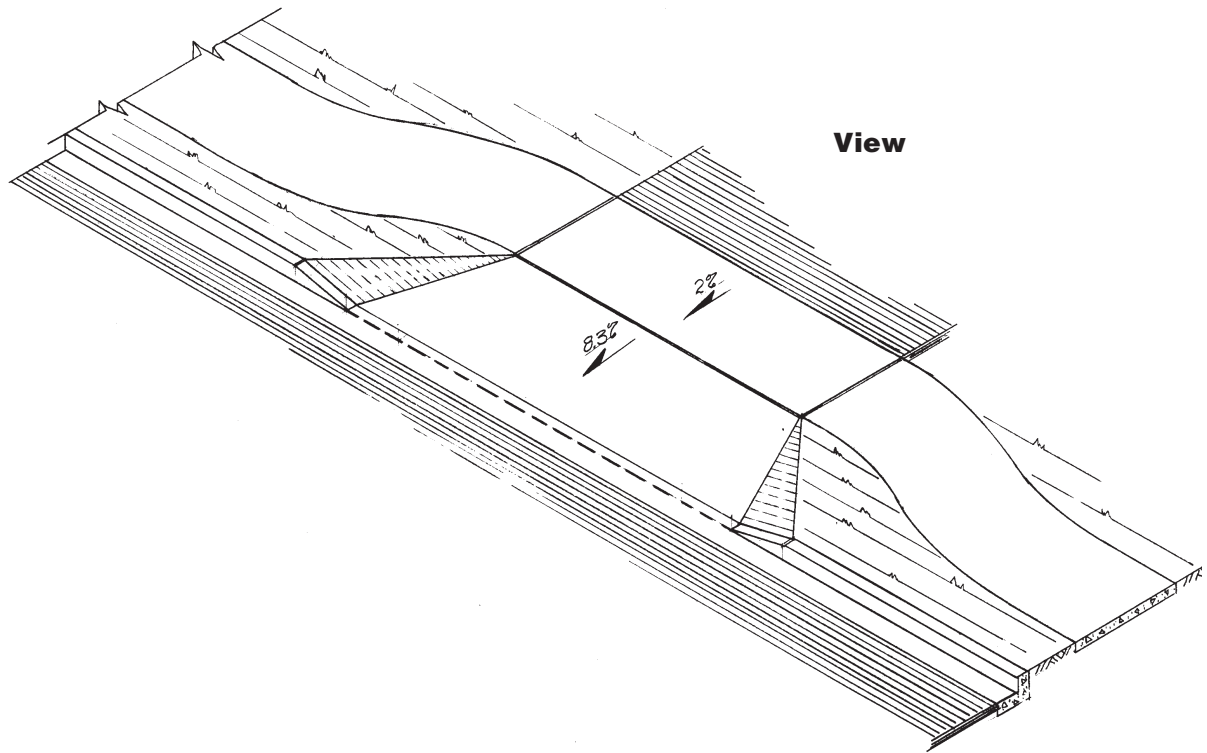


Figure 3-2
Plan — Driveway Approach Detail B

Driveway Approach Detail C — Routed Sidewalk, Planting Strip Present

This detail addresses a condition where the sidewalk is separated from the curb by a planting strip and is similar to Driveway Approach Detail B in that the sidewalk is routed behind the approach. The width of the planting strip has a direct effect on the length of the rerouted sidewalk. Values for these offsets are shown in the table accompanying this drawing. Relocation of the sidewalk is not necessary when the planting strip equals or exceeds 6 feet. Also, as in the case of Driveway Approach Detail B, that portion of the sidewalk in the approach must be thickened and the approach slope should not exceed 8.3 percent, if wheelchair access to the street is desired.



Section — Driveway Approach Detail C

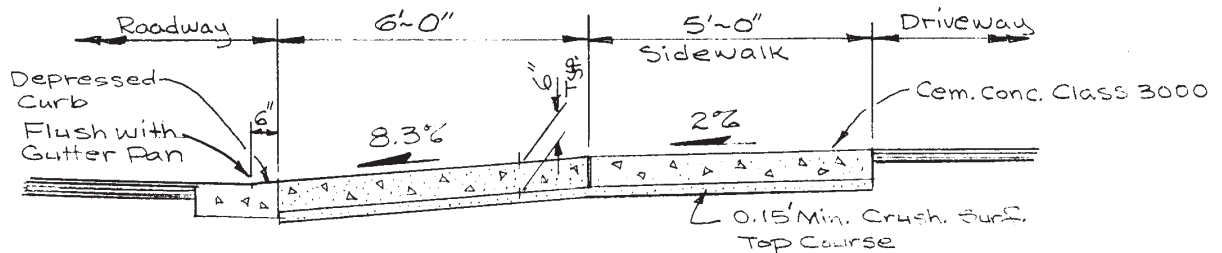


Figure 3-3A
Driveway Approach Detail C

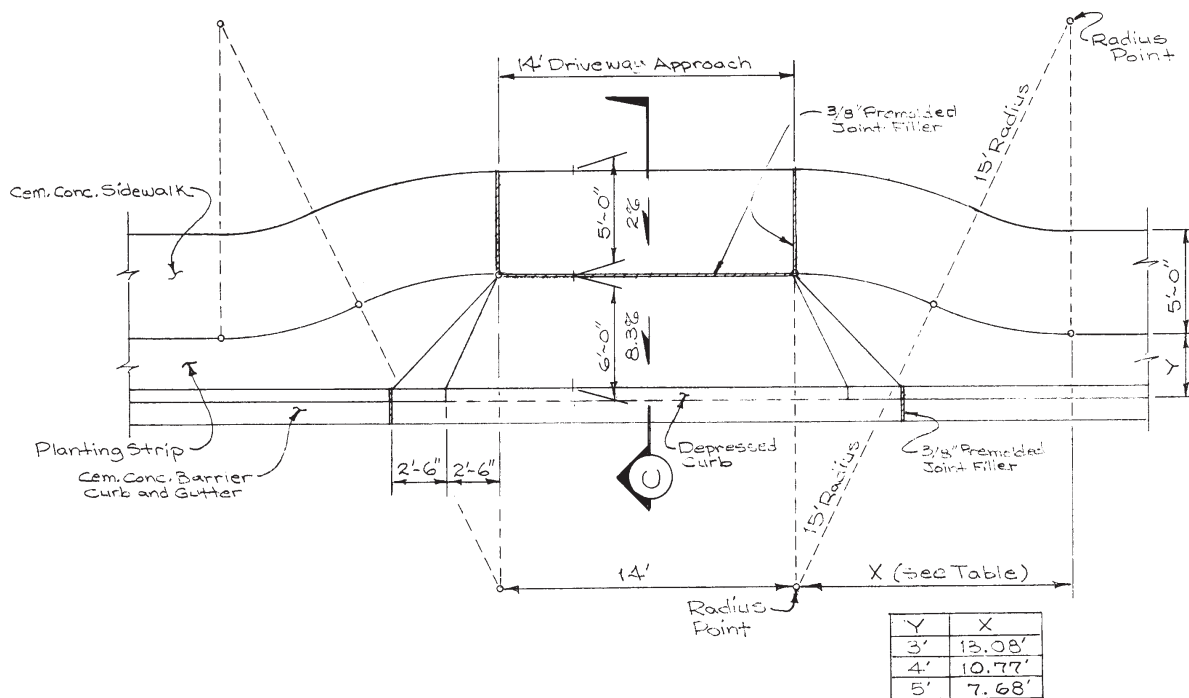


Figure 3-3B
Plan — Driveway Approach — Detail C

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